



Job quality in growing and declining economic sectors of the EU

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Work and Life Quality
in New & Growing Jobs

walqing working paper 2011.3

Job Quality in Growing and Declining Economic Sectors of the EU

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Manchester, May 2011

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Introduction

A central aim of the European Employment Strategy since the Lisbon Treaty of 2000 has been to promote ‘more and better’ jobs: a recognition that the nature of a job can have a profound impact on the well-being of employees and that employee well-being and productivity are linked. Creating more and better jobs has also been seen as a vehicle to promote a wider social agenda concerned with increasing the employment rates of groups that, historically, have had low levels of participation in the workforce particularly in high quality jobs.

In terms of employment growth, the European Employment Strategy would appear to have been successful in increasing the total number of jobs and the employment rate, i.e., the percentage of the available workforce in employment. From 2000 to 2008, figures from the Labour Force Survey suggest that the number of jobs in the EU increased from 209.874 million to 226.552 million (an increase of 7.9%) and the employment rate increased from 63.2 to 64.6 percent. The increase in the number of jobs was, however, largely confined to the service sector. The proportion of service sector jobs rose from 65.9 to 70.4%, while the proportion of jobs in the agricultural sectors declined from 7.3 to 5.6% and, in the industrial sectors, it declined from 26.8 to 24%.

Given that more jobs have been created, it is also important to know their quality. One way of addressing this issue is to examine job quality in growing sectors (e.g., services, construction) and in declining sectors (e.g., manufacturing, energy supply, agriculture). If jobs are being created in sectors where levels of job quality have traditionally been high, this might indicate that better jobs are being created. However, there has yet to be a general review of the published evidence on job quality in growing and declining sectors within the EU. Studies have reported on sectoral differences in job quality but have not discussed these differences with regard to growing and declining sectors. Furthermore, the evidence on sectoral differences in job quality is fragmented, as previous studies providing information on this topic have examined different aspects of job quality, measured job quality in different ways and used different data sources. It can also be observed that there has yet to be a detailed analysis using empirical data with a specific focus on job quality in growing and declining sectors within the EU.

To provide a detailed review and analysis of job quality in new and growing sectors of the EU economy, it is therefore necessary to conduct a review of the current literature on job quality in Europe and also to conduct new analyses on this topic. As such, this report has three main aims. The first aim is to review the current literature for evidence of the nature and effects of job quality in growing and declining sectors within the EU. In particular, we seek to identify the level of job quality within growing and declining sectors and to compare the level of job quality between growing and declining sectors. The second aim is to examine how the level of job quality varies between growing sectors and sub-sectors of the economy in the European Union¹ and Norway using the European Working

¹ To harmonize the results across other reports in the WALQING project we had to excluded Malta, Romania, and Bulgaria. The general pattern of results was not significantly affected by this exclusion.

Conditions Survey data set from 2005. The third aim is to develop a taxonomy of job types in the European Union, to establish the job quality of these job types, and to then examine the distribution of job types in growing sectors of the European economy. Examining the distribution of job types in this way will help to provide a more nuanced understanding of the distribution of job quality in Europe.

To meet these aims, the report has four parts. Part 1 discusses the concept of job quality and provides a definition that is used throughout the report. Parts 2, 3 and 4 address the first, second and third aims of the report respectively.

1 PART 1: Defining Job Quality

The concept of job quality is concerned with the impact that a job has on an employee and although two broad approaches to job quality can be detected within the literature - subjectivist and objectivist - a central assumption in both is that a high quality job will have more positive effects on an employee than a low quality job (Green, 2006). We now set out these two broad approaches.

1.1 Subjectivist Approaches to Job Quality

The subjectivist approach to job quality focuses on the extent to which a job fulfils an employee's preferences. Job quality is therefore entirely based on an employee's subjective evaluation of a job. The subjectivist approach is predominant in neo-classical economics, where it is typically assumed that the most important aspect of work is the level of reward, and the main reward is pay. High pay is preferred by employees as it enables greater consumption and compensates for poor working conditions and therefore provides them greater fulfilment and satisfaction (Borjas, 1979). Thus, within neo-classical economics, wages are seen to be the key indicator of job quality.

Another perspective within the subjectivist approach is that job satisfaction can be used to express the level of job quality. This rests on assumptions that job quality is entirely based on an employee's subjective evaluation of preference fulfilment and that preference fulfilment results in satisfaction. Job satisfaction therefore represents a measure of the utility received from work and as such is synonymous with job quality (Clark & Oswald, 1996).

The subjectivist approach to job quality is questionable for a number of reasons. First, it ignores the fact that employees have objectively different working conditions and that such conditions shape the experience of work over and above any personal preferences (Parker & Wall, 1999). Second, employees' experiences of work are varied and wide-ranging and cannot be reduced to preference fulfilment. Third, employees do not rate wages as the most important aspect of work (Bustillo, Fernandez-Macías, Antón & Esteve, 2009) and studies indicate that work characteristics such as job design can play a more important role in shaping employee experiences of work than pay. Fourth, employee reports of job satisfaction are likely to be influenced by factors other than preference fulfilment (e.g., individual differences, task demands) such that job satisfaction is not entirely synonymous with job quality (Bustillo & Fernandez-Macías, 2005). Overall, this implies that job quality cannot be directly equated with an employee's subjective evaluation of preference fulfilment and job satisfaction, and that wages are not the key indicator of job quality.

1.2 Objectivist Approaches to Job Quality

An objectivist approach to job quality assumes that objective features of the job are the predominant cause of employee experiences at work, that there is a high degree of generalisability in the way that objective work conditions affect employees, and that a high

quality job will fulfil basic human motives (e.g., autonomy, affiliation, security) (Deci & Ryan, 1985) and promote employee-centred outcomes such as psychological well-being (i.e., the presence of positive affective states and absence of negative affective states) and physical well-being (Warr, 1990). High quality jobs therefore have objectively different features and produce different outcomes than low quality jobs.

The objectivist approach is typically adopted within sociological and psychological research traditions. Although different disciplines have tended to promote different job features as being the prime indicators of job quality, most of the job features typically included in objectivist studies of job quality fall into one or more of the following five dimensions (Bustillo et al., 2009; European Commission, 2001; Green, 2006; Leschke & Watt, 2008; Tangian, 2007; Tilly, 1997):

- Work organisation, e.g., job design (job discretion, job demands, ergonomics, physical conditions) and team design (participation in off and on-line teams);
- Wages and payment system, e.g., wage level, performance related pay, benefits;
- Security and flexibility, e.g., contractual status, flexible working arrangements, working time;
- Skills and development, e.g., skill requirements, training, opportunity for development;
- Collective representation and voice, e.g., trade union agreements, employee participation practices.

An objectivist perspective views a subjectivist approach as over-estimating the importance of employee preferences for particular work and employment conditions with regard to their effect on employee outcomes, e.g., individual well-being. One reason for this view is the assumption that objective job features have a relatively greater effect on employee well-being than employee preferences (Parker & Wall, 1999). Thus, although employee preferences for particular work and employment conditions play a role in shaping outcomes, their role is not as great as objective job features. A further reason concerns the relative effects of employee preferences for particular work and employment conditions and other employee goals. Employee preferences and expectations about work and employment conditions can be conceptualised as goals that the worker seeks to attain and against which they evaluate their current state (Locke & Latham, 1990). Employees have many different types of goal (e.g., task goals of performing well, affiliative goals of getting on with colleagues). The effects of work and employment condition goals (i.e., preferences) must be considered in relation to the effects of these other goals. Such task and affiliative goals may have a stronger impact on employees than preferences because their attainment is of greater importance to employees on an everyday basis (Lazarus, 1991).

An important variation of the objectivist approach to job quality draws on the capabilities approach of Sen (e.g., Sen, 1985; Sen & Nussbaum, 1993) (Green, 2006). Sen argues that personal well-being can be considered in terms of a person's capability to do valuable acts or achieve valuable states of being. These valued 'doings' and 'beings' are called 'functionings' and, although Sen has not specified what these are, Sen and Nussbaum

identified key functionings as: bodily health; emotions; practical reason; affiliation; play, and; control over one's environment. It can be noted that these functionings are very similar to components of eudemonic well-being, a perspective that also views personal well-being as consisting of a broader range of states than psychological hedonic well-being (e.g., satisfaction, happiness). For example, Ryff and Keyes (1995) have proposed a eudemonic approach to personal well-being for which the key elements are:

- Autonomy, a sense of self determination;
- Personal growth, a sense of continued growth and development;
- Positive relations, having secure, intimate and rewarding attachments with others;
- Purpose in life, that one's life has a purpose and meaning;
- Self-acceptance, a positive evaluation of one's self and past;
- Environmental mastery, a capacity to manage one's surroundings.

Personal capability is not just a matter of being able to achieve valued functionings but also refers to the opportunities and choices a person has to undertake a range of valued actions. A person's capability is greater if they chose to do *x* from a wide range of options, than a person who chooses to do *x* from very limited range of options. Sen also introduces the notion of 'goods' and 'conversion factors'. Goods are factors that increase a person's capability and enable a person to achieve valued functionings. Furthermore, the relation between a good and the ability to achieve a functioning is influenced by conversion factors that can be personal (e.g., age, gender, individual characteristics and beliefs), social (e.g., positive social relationships), and environmental (e.g., access to key resources).

One implication of the capability approach for the understanding of job quality is that a broad view must be taken with regard to the individual-level outcomes of a job, such that that the outcomes of a job cannot be seen narrowly in terms of preference fulfilment or satisfaction. Another implication is that that job features are goods that enhance or inhibit the ability of the person to achieve valued functionings. The particular value of a job feature for job quality can therefore be considered in relation to the extent to which it promotes or inhibits the achievement of a valued outcome. For example, job autonomy might promote higher levels of well-being than pay and thus makes a more significant contribution to job quality. However, a capability approach does not provide a means of establishing which job features are of more value than others and thus which job features make a greater contribution to job quality. In addition, the value or quality of a job can be seen in relation to the extent to which allows the person to choose from a range of options with regard to how they want to act or be, both now and in the future. For these reasons, we label this type of approach as an 'objectivist-capability' approach.

A subjectivist approach defines job quality as the extent to which a job fulfils an employee's preferences, an objectivist approach defines job quality as the extent to which a job has features that promote beneficial outcomes for the employee, whilst an objectivist-capability approach would define job quality as the extent to which a job has features that enhance the capability of the employee to choose and achieve valued and beneficial outcomes (Green, 2006). In this report, we take an objectivist-capability

approach to job quality because of the limitations of the subjectivist approach and also because it offers a broader vision of the key features of job quality and its outcomes. We now review the literature on the main features of job quality and the main outcomes of job quality.

1.3 Classifications and Dimensions of Job Quality

Although there is broad consensus that job quality is multi-dimensional, reflecting the multi-faceted nature of a job, there is less consensus on the number and content of those dimensions. Some examples of current job quality classifications and number of dimensions include²:

- 15, e.g., Tangian (2007)
- 10, e.g., Laeken Job Quality Indicators (European Commission, 2001),
- 7, e.g., Tilly (1997)
- 6, e.g., Leschke, Watt and Finn (2008); Green (2006)
- 4, e.g., Eurofound (2007)
- 3, e.g., Grimshaw and Lehndorff (2010)

The content of the dimensions covered in these classifications can be seen in Table 1.1. From this it is noticeable that some classifications include dimensions that are not strictly properties of the job. For example, certain dimensions are concerned with labour market conditions (e.g., access to the labour market), with properties of the organisational context (e.g., gender balance), and with outcomes of the job at the individual level (e.g., psychological well-being, physical well-being, work-life balance) and organisational level (e.g., economic performance). When these non-job-related dimensions are removed, most classifications include job-related features that fit into one or more of the following five dimensions:

- Work organisation, e.g., job design (job discretion, job demands, ergonomics, physical conditions) and team design (participation in off and on-line teams);
- Wages and payment system, e.g., wage level, performance related pay, benefits;
- Security and flexibility, e.g., contractual status, flexible working arrangements, working time;
- Skills and development, e.g., skill requirements, training, opportunity for development;
- Collective representation and voice, e.g., employee participation practices.

² A more comprehensive list of job quality classifications is beyond the scope of this report. However, the classifications described are selected because they provide a good representation of the different types of classifications available in terms of breadth and content. Many of the classifications selected here are also used by other authors, e.g., Tangian's (2007) classification is used by the Confederation of German Trade Unions (DGB, 2007); the EC (2001) Laeken classification is used by Davione, Erhel & Guergoat-Lariviere (2008); the Eurofound classification (2007) is used within many of their reports.

Table 1.1: Examples of Classifications of Job Quality Dimensions

Tangian, 2007	EC Laeken Job Quality Index, 2001	Tilly, 1997	Leschke, Watt & Finn, 2008	Green, 2006	Eurofound, 2007	Grimshaw & Lehndorff, 2010
1. Qualification & development possibilities	1. Intrinsic job quality	Wages	Wages	1. Skill	1. Career & employment security	1. Work quality
2. Creativity (job complexity/ possibilities to develop own ideas)	2. Lifelong learning & career development	Fringe benefits	Non-standard forms of employment	2. Work effort	2. Health & well-being	2. Employment quality
3. Career chances (in the enterprise)	3. Gender equality	Due process in discipline	Working time & work-life balance	3. Job discretion	3. Skills development	3. Empowerment quality
4. Possibilities for influence & initiative	4. Health & safety	Working hours & flexibility	Working conditions & job security	4. Pay	4. Reconciliation of work & non-working life	
5. Communication & transparency	5. Flexibility & security	Permanence	Skills & Career development	5. Risk & security		
6. Quality of management /leadership	6. Inclusion & access to the labour market	Upward mobility	Collective representation	6. Job satisfaction		
7. Industrial culture	7. Work organisation & work-life balance	Control over the work process				
8. Assistance from colleagues	8. Social dialogue & employee involvement					
9. Meaningfulness of work	9. Diversity & non-discrimination					
10. Working time	10. Economic performance & productivity					
11. Work intensity						
12. Physical strains						
13. Emotional strains						
14. Job security						
15. Income						

These five dimensions fit into the framework of job quality proposed by Grimshaw and Lehndorff (2010). Their tripartite framework is particularly useful because it separates job features associated with the quality of working conditions (i.e., work organisation), with the quality of employment conditions (i.e., wage and payment system, security and flexibility), and with the quality of empowerment (i.e., skills and development, collective representation and voice). Integrating the five dimensions of job quality with Grimshaw and Lehndorff's relatively under-specified framework enables a classification of job quality to be created that is both parsimonious in terms of the number of key dimensions, as well as comprehensive in terms of its coverage. This integrated classification can be seen in Table 1.2.

Table 1.2: Summary Classification of Job Quality

Area of Job Quality	Dimension	Example Indicators
A. Work quality	1. Work organisation	Job design, e.g., job discretion, job demands, ergonomics, physical conditions Team design, e.g., off and on-line teams, autonomous work groups
	2. Wages and payment system	Wage level, performance related pay, benefits;
B. Employment quality	3. Security and flexibility	Contractual status, flexible working arrangements, working time
	4. Skills and development	Skill requirements, training, opportunity for development
C. Empowerment quality	5. Engagement and representation	Employee engagement and communication practices.

1.4 Outcomes of Job Quality

The outcomes of job quality can be conceptualised according to two dimensions: the type of outcome, whether it relates to well-being or performance, and; the level of outcome, whether it occurs at an employee, organisational or societal level. These two dimensions are represented in Table 1.3.

Table 1.3: Outcomes of Job Quality

Outcome Level	Outcome Type		
	Well-Being		Performance
	Psychological Well-Being	Physical Well-Being	
<i>Individual</i>	Hedonic Eudemonic	Physical health Musculoskeletal disorders	Task performance
<i>Organisational</i>	Sickness rates Quit rates	Sickness rates Safety rates	Productivity
<i>Societal</i>	Mental health rates	Morbidity and mortality rates	Gross domestic product

At the individual level, well-being-related outcomes concern both physical well-being and psychological well-being. Physical well-being refers to being free from illness and free from musculoskeletal disorders. Psychological well-being can be understood from hedonic and eudemonic perspectives. From a hedonic perspective, psychological well-being represents the presence of longer-term levels of pleasant affect such as enthusiasm and contentment, and the absence of unpleasant affect such as anxiety and sadness (Diener, Eunkook, Lucas, & Smith, 1999; Warr, 1990). Other constructs such as job burnout and engagement can also be viewed as hedonic conceptualisations of well-being (Maslach, Schaufeli, & Leiter, 2001; Schaufeli, Salanova, Gonzalez-Romá & Bakker, 2002). Eudemonic approaches posit that there is more to being well than achieving happiness and satisfaction, and that well-being is better expressed as the achievement of positive psychological functioning. As noted earlier, Ryff and Keyes (1995) identified six key elements of positive psychological functioning, e.g., autonomy, a sense of self-determination; personal growth, a sense of continued growth and development; positive relations, having secure, intimate and rewarding attachments with others. Another outcome at the individual level includes performance. Performance may be defined as in-role (i.e., task achievement), and extra-role (i.e., the display of citizenship behaviours).

At the organisational level, outcomes such as quit rates or sick rates are indicators of employee well-being (Griffeth, Hom, & Gaertner, 2000), while performance outcomes may include organisational efficiency and profitability. At the societal level, well-being related outcomes concern mortality, morbidity and mental health rates, while performance related outcomes encompass broader factors such as gross domestic product.

The vast majority of studies on job quality take a *well-being-based* perspective that considers job quality in relation to the factors that promote well-being. Few studies adopt a *performance-based* perspective that considers job quality in relation to the job factors that promote performance. For this reason, a well-being-based perspective will be adopted in this report. It is also important to note that most cross-national comparative studies of job quality have focused on physical well-being and the affective state of satisfaction, which has been shown to be most similar to the affective states of calmness and contentment

(Watson & Clark, 1997; Watson, Clark & Tellegen, 1988). We were unable to locate any studies in this area that examined a wide range of hedonic states of well-being (e.g., anxiety, sadness) or eudemonic well-being. As a result, cross-national studies of job quality provide only a very partial account of job related employee well-being.

1.5 Summary

In this report we define job quality as the extent to which a job has factors that promote valued outcomes for the employee. The main factors of a job are areas and dimensions of job quality are (1) work quality, which includes the dimension of work organisation, (2) employment quality, which includes the dimensions of wages and payment system, and security and flexibility, (3) and empowerment quality, which includes the dimensions of skills and development, and engagement and representation. The main valued outcomes of job for an employee are defined as well-being (i.e., physical and psychological well-being) and performance. In this report we focus in particular on employee well-being as the main valued outcome of the job.

2 PART 2: A Review of the Literature on Job Quality in Growing and Declining Sectors of the EU

The first aim of this report is to review the current evidence on the nature and effects of job quality in growing and declining industrial sectors within the EU. A prerequisite for this is to set out the level of sectoral job growth and decline. This was examined by Vandekerckhove and Ramioul (2010) as part of the WALQING project, who focused on economic sectors at NACE Level 1 and NACE Level 2 (a more detailed level of sectoral classification) over the period of 2000-2007, a period that was chosen because each date represents two peaks of the business cycle in Europe. The level of sectoral growth at NACE Level 1 is shown in Table 1.1 but the level of growth for each sector when placed in rank order is shown below. This shows that employment growth was greatest in service sectors and that manufacturing and agricultural sectors tended to experience the greatest contraction.

— Business (e.g., retail estate, renting and other business activities)	3.40
— Construction	2.33
— Health and social work	1.21
— Retail (e.g., wholesale and retail trade)	0.62
— Other services (e.g., community, social and personal services)	0.55
— Education	0.47
— Private households	0.47
— Hotels and restaurants	0.38
— Public administration and defence	0.19
— Extra-territorial organisations and bodies	0.04
— Financial Intermediation	0.03
— Mining	-0.24
— Energy (e.g., electricity, gas and water supply)	-0.24
— Transport	-0.34
— Manufacturing	-3.04
— Agriculture	-3.62

With regard to the eleven sectors showing expansion at NACE Level 1, growth was also positive across its sub-sectors (i.e., at NACE Level 2). The only exception to this was the financial intermediation sector in which the 'Insurance and pension funding, except compulsory social security' sub-sector exhibited a decline in the number of jobs. The sectors that experienced an overall decline and a decline across all sub-sectors included agriculture, energy and mining. The sectors that experienced an overall decline but with some growth in sub-sectors included manufacturing and transport, with examples of growing sub-sectors including 'Manufacture of fabricated metal products' and 'Supporting and auxiliary transport activities'.

The general pattern is of job growth in the service sectors, and job decline in agriculture, manufacturing and energy supply. This pattern can be illustrated further by an inspection of the ten sub-sectors that show the highest levels of job growth and the ten sub-sectors that showed the highest level of decline (see Table 2.2). The sub-sectors with the highest levels of growth were from service sectors, whilst the majority of sub-sectors with the highest levels of decline were from the agricultural or manufacturing sectors.

Table 2.1: Index of Job Growth by Industrial Sector, 2000-2007

NACE 1-digit	BART	NACE 2-digit	Growth
A&B: Agriculture and fishing	-3.62%		
		1.00 'Agriculture, hunting and related service activities'	-3.32%
		2.00 'Forestry, logging and related service activities'	-0.08%
		5.00 'Fishing, fish farming and related service activities'	-0.06%
C: Mining	-0.24%		
		10.00 'Mining of coal and lignite; extraction of peat'	-0.19%
		11.00 'Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction'	-0.11%
		12.00 'Mining of uranium and thorium ores'	-0.04%
		13.00 'Mining of metal ores'	-0.06%
		14.00 'Other mining and quarrying'	-0.03%
D: Manufacturing	-3.04%		
		15.00 'Manufacture of food products and beverages'	-0.97%
		16.00 'Manufacture of tobacco products'	-0.06%
		17.00 'Manufacture of textiles'	-0.53%
		18.00 'Manufacture of wearing apparel; dressing and dyeing of fur'	-0.58%
		19.00 'Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear'	-0.34%
		20.00 'Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting'	-0.12%
		21.00 'Manufacture of pulp, paper and paper products'	-0.18%
		22.00 'Publishing, printing and reproduction of recorded media'	-0.18%
		23.00 'Manufacture of coke, refined petroleum products and nuclear fuel'	-0.07%

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NACE 1-digit	BART	NACE 2-digit	Growth
D: Manufacturing		24.00 'Manufacture of chemicals and chemical products'	-0.18%
		25.00 'Manufacture of rubber and plastic products'	0.01%
		26.00 'Manufacture of other non-metallic mineral products'	-0.10%
		27.00 'Manufacture of basic metals'	-0.34%
		28.00 'Manufacture of fabricated metal products, except machinery and equipment'	0.20%
		29.00 'Manufacture of machinery and equipment n.e.c.'	-0.26%
		30.00 'Manufacture of office machinery and computers'	-0.12%
		31.00 'Manufacture of electrical machinery and apparatus n.e.c.'	-0.02%
		32.00 'Manufacture of radio, television and communication equipment and apparatus'	-0.20%
		33.00 'Manufacture of medical, precision and optical instruments, watches and clocks'	0.07%
		34.00 'Manufacture of motor vehicles, trailers and semi-trailers'	0.17%
		35.00 'Manufacture of other transport equipment'	-0.07%
		36.00 'Manufacture of furniture; manufacturing n.e.c.'	-0.22%
		37.00 'Recycling'	0.04%
E: Energy (i.e., electricity, gas and water supply)	-0.24%		
		40.00 'Electricity, gas, steam and hot water supply'	-0.27%
		41.00 'Collection, purification and distribution of water'	-0.01%
F: Construction	2.33%		
		45.00 'Construction'	2.46%

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NACE 1-digit	BART	NACE 2-digit	Growth	
G:	Retail (i.e., wholesale and retail trade)	0.62%		
		50.00	'Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel'	0.07%
		51.00	'Wholesale trade and commission trade, except of motor vehicles and motorcycles'	0.39%
		52.00	'Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods'	0.02%
H:	Hotels and restaurants	0.38%		
		55.00	'Hotels and restaurants'	0.35%
I:	Transport	-0.34%		
		60.00	'Land transport; transport via pipelines'	-0.20%
		61.00	'Water transport'	-0.06%
		62.00	'Air transport'	-0.10%
		63.00	'Supporting and auxiliary transport activities; activities of travel agencies'	0.32%
		64.00	'Post and telecommunications'	-0.35%
J:	Financial intermediation	0.03%		
		65.00	'Financial intermediation, except insurance and pension funding'	0.04%
		66.00	'Insurance and pension funding, except compulsory social security'	-0.23%
		67.00	'Activities auxiliary to financial intermediation'	0.16%
K:	Business	3.40%		
		70.00	'Real estate activities'	0.30%

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NACE 1-digit		BART	NACE 2-digit		Growth
K:	Business	3.40%	71.00	'Renting of machinery and equipment without operator and of personal and household goods'	0.05%
			72.00	'Computer and related activities'	0.51%
			73.00	'Research and development'	0.02%
			74.00	'Other business activities'	2.39%
L:	Public administration and defence	0.19%	75.00	'Public administration and defence; compulsory social security'	0.16%
M:	Education	0.47%	80.00	'Education'	0.45%
N:	Health and social work	1.21%	85.00	'Health and social work'	1.32%
O:	Other service activities	0.55%	90.00	'Sewage and refuse disposal, sanitation and similar activities'	0.07%
			91.00	'Activities of membership organisations n.e.c.'	0.11%
			92.00	'Recreational, cultural and sporting activities'	0.28%
			93.00	'Other service activities'	0.13%
P:	Private households with employed persons	0.47%	95.00	'Activities of households as employers of domestic staff'	0.36%
Q:	Extra-territorial organisations and bodies	0.04%	99.00	'Extra-territorial organisations and bodies'	0.00%
Total					1.16%

Table 2.2: Top Ten Growing and Top Ten Declining Sub-Sectors

NACE 1-digit		NACE 2-digit		Growth
F:	Construction	45.00	'Construction'	2.46%
K:	Business	74.00	'Other business activities'	2.39%
N:	Health and social work	85.00	'Health and social work'	1.32%
K:	Business	72.00	'Computer and related activities'	0.51%
M:	Education	80.00	'Education'	0.45%
G:	Retail	51.00	'Wholesale trade and commission trade, except of motor vehicles and motorcycles'	0.39%
P:	Private households with employed persons	95.00	'Activities of households as employers of domestic staff'	0.36%
H:	Hotels and restaurants	55.00	'Hotels and restaurants'	0.35%
I:	Transport	63.00	'Supporting and auxiliary transport activities; activities of travel agencies'	0.32%
K:	Business	70.00	'Real estate activities'	0.30%
J:	Financial intermediation	66.00	'Insurance and pension funding, except compulsory social security'	-0.23%
D:	Manufacturing	29.00	'Manufacture of machinery and equipment n.e.c.'	-0.26%
E:	Energy	40.00	'Electricity, gas, steam and hot water supply'	-0.27%
D:	Manufacturing	19.00	'Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear'	-0.34%
D:	Manufacturing	27.00	'Manufacture of basic metals'	-0.34%
I:	Transport	64.00	'Post and telecommunications'	-0.35%
D:	Manufacturing	17.00	'Manufacture of textiles'	-0.53%
D:	Manufacturing	18.00	'Manufacture of wearing apparel; dressing and dyeing of fur'	-0.58%
D:	Manufacturing	15.00	'Manufacture of food products and beverages'	-0.97%
A&B:	Agriculture & Fishing	1.00	'Agriculture, hunting and related service activities'	-3.32%

2.1 Job Quality in Growing and Declining Sectors within the EU

Having defined job quality and set out the levels of job growth and decline in industrial sectors, we now address the main purpose of this report: to review the current evidence on job quality in growing and declining industrial sectors within the EU. This will be achieved by comparing job quality between growing and declining sectors. In principle, four different combinations of sectoral growth and job quality can be identified. They are:

- Growing sectors of the economy with high job quality, i.e., more and better jobs;
- Growing sectors of the economy with low job quality, i.e., more bad jobs;
- Declining sectors of the economy with high job quality, i.e., fewer better jobs;
- Declining sectors of the economy with low job quality, i.e., fewer bad jobs.

A possible temptation when studying job quality amongst growing and declining sectors is to assume that an increase (or decrease) in the size of a sector with high job quality will lead to an increase (or decrease) in the general level of job quality. However, the total level of change in job quality will be a product of: (a) changes in job quality common to all sectors in the European economy, and; (b) changes in job quality resulting from shifts in the size of sectors. This means that changes in job quality resulting from shifts in sector size must be considered within the context of wider changes across all sectors. For example, it could be the case that although there has been an increase in the size of sectors with relatively high levels of job quality, this may not result in an increase in the general level of job quality if there has been a general downward trend in job quality across all sectors. An alternative scenario could occur where there has been an increase in the size of sectors with high job quality but it only accounts for a small proportion of the total change in job quality because the main driving force for change in job quality is not sectoral growth or decline, but changes common to all sectors. One study that examined this issue focused on skill requirements in European manufacturing sectors (European Commission, 2007). An increase in the proportion of jobs with high skill requirements in manufacturing from 1995 to 2005 was found to be largely a result of a general process of up-skilling occurring across all manufacturing sectors rather than a shift toward manufacturing sectors with higher skill requirements. Unfortunately, few studies have been conducted where changes in job quality resulting from shifts in sector size are considered within the context of wider changes across all sectors.

Bearing this cautionary note in mind, we now review the literature on job quality in growing and declining industrial sectors within the EU. We do this for each of the five main dimensions of job quality previously identified.

2.1.1 Work Organisation

Work organisation is concerned with job design characteristics (e.g., job discretion, job demands, ergonomics, physical conditions, relationships with others) and team design characteristics (e.g., participation in off and on-line teams, autonomous work groups). Jobs with high quality work organisation will have a more beneficial effect on well-being than jobs with low quality work organisation. A useful framework for understanding the effects of work organisation on employee well-being is job demands-resource theory,

which identifies two types of job characteristic; job demands and job resources (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

Job demands are the physical, social and organisational aspects of work that require psychological and/or physical attention and effort to overcome. Job demands include workload, cognitive demands (e.g., problem solving demands, attention demands), emotional demands and physical demands (see Table 2.3 for a more comprehensive list). In general, high levels of demands have a negative effect on psychological well-being as the effort involved in dealing with them depletes energy reserves and leads to lower well-being (Hockey, 1997); low levels of job demands are also associated with lower well-being as they can lead to low stimulation and boredom. Moderate levels of job demands are most advantageous as they provide a level of demand that is stimulating but not overwhelming³.

Job resources are the aspects of work that enable employees to manage job demands, facilitate the achievement of goals, promote learning and fulfil basic human needs (Deci & Ryan, 1985; Schaufeli & Bakker, 2004). Job resources include job control, feedback, participation, skill utilization and social support (Humphrey, Nahrgang, & Morgeson, 2007; Terry & Jimmieson, 1999; Van der Doef & Maes, 1999) (see Table 2.3 for a more comprehensive list). Job resources typically have a positive effect on well-being as they enable employees to manage demands in a way that is least effortful, help promote skill development (which also enables employees to cope better with demands) and fulfil basic needs, e.g., the need for autonomy or competence (Hackman & Oldham, 1980; Holman & Wall, 2002; Jackson, 1983; Karasek & Theorell, 1990).

Employees in jobs that combine high resources and moderate levels of demand generally have higher levels of well-being than employees in jobs with other combinations of levels of demands and resources, such as high resources with high demands, or low resources with high demands (Taris & Kompier, 2005). This is thought to occur because moderate levels of demand provide a degree of challenge, while the high resources enable the person to manage the challenge in a way that promotes achievement and learning.

High job resources are typically associated with higher levels of well-being and can therefore be viewed as indicative of higher job quality. High and low job demands are typically associated with lower levels of well-being and can therefore be viewed as indicative of low job quality. Jobs that combine high levels of resources and moderate levels of demands can be viewed as having a higher job quality than jobs with other combinations of resources and demands.

Studies on sectoral differences in the quality of work organisation include those by Tangian (2007), Greenan, Kalugina and Walkowiak (2010), Valeyre, Lorenz, Cartron, Csizmadia, Gollac, Illéssy and Makó (2009), and Parent-Thirion, Macias, Hurley and

³ There is also evidence to suggest that some types of demand, e.g., problem-solving demand, may be associated with higher well-being, but this may only be because they promote job resources, which in turn have an effect on well-being (see Holman & Wall, 2002).

Vermeylen (2007). All of these studies are based on the European Working Conditions Survey (EWCS) (EWCS, 1995; 2000; 2005).

Table 2.3: Types of Job Demand and Job Resources

Job Demands	Job Resources
<i>Workload</i>	<i>Task resources</i>
Quantitative workload	Job control/Discretion
Pace of work	Task variety
<i>Cognitive demands</i>	Skill utilization
Problem-solving demands	<i>Relational resources</i>
Attention demands	Constructive feedback
Responsibility demands	Social support
<i>Emotional demands</i>	<i>Participation</i>
Display of emotions	
<i>Interaction demands</i>	
Difficult interactions	
<i>Physical demands</i>	
Repetitive movements	
Lifting loads	

Note: Some job characteristic constructs are amalgamations of different demands and resources, e.g., job complexity, which can be viewed as a combination of high levels of problem solving demands with high levels of control and variety.

Tangian (2007) used items from the EWCS 2005 to measure fifteen dimensions of job quality. Eight of these dimensions relate wholly or in part to work organisation and are: creativity (i.e., job complexity, non-repetitive tasks, applying own ideas, problem solving and intellectually demanding tasks), possibilities for influence (i.e., job discretion); meaningfulness of work; work intensity; physical strains; emotional strains; industrial culture (i.e., team work, task rotation plus support from boss); and assistance from colleagues⁴.

For each dimension, Tangian created two indexes. The first index was a simple sum of standardized item scores. This can be seen as an absolute measure of job quality, and ranged from 0-100. Tangian suggested that scores above 80 represented very high quality, 70-80 represented high quality, 60-70 represented a moderate level of quality, 50-60 represented inferior quality, and below 50 represented poor quality. However, no justification for these bands was offered. The second index was created using a method recommended by the OECD, in which each item is standardized such that the mean is zero and the standard deviation is equal to one. When standardizing, this method helps to discriminate between closely located typical values in the presence of outliers. However,

⁴ To reflect job quality, work intensity, physical strains and emotional strains are reverse scored, e.g., jobs with a lower intensity have a higher score.

this process “relativizes ‘good’ and ‘bad’ values” (Tangian, 2007, p. 24) and thus scores can only be used to establish the relative difference between sectors and they cannot be used to infer the absolute levels of job quality in any one sector.

The absolute index scores for work organisation can be seen in Table 2.4 and the relative index scores are in Table 2.5. By combining this with our knowledge of sectoral growth and decline we suggest there are four groups of sectors. They are:

- *Growing sectors with upper-moderate levels of work organisation quality and higher than average levels of work organisation quality:* The sectors in this group are: financial intermediation, business (i.e., retail estate, renting and other business activities), public administration, education, and health and social work. According to Tangian’s (2007) classification, these sectors typically have moderate to high levels of work organisation quality; the level of job resources (i.e., job complexity, job discretion, meaningfulness and assistance from colleagues) are typically higher than average, and; the level of job demands (i.e., work intensity, physical strains) are typically lower than average. One exception to this is with regards to emotional intensity, where sectors with lower levels of work organisation quality, e.g., manufacturing and agriculture, are found to have lower emotional strains. This most likely reflects the fact that the jobs in these sectors involve less interpersonal interactions. In addition, there is no distinct pattern of sectoral difference with regard to the industrial culture index, but this might reflect the odd nature of the index that reflects both team work and support from one’s boss.
- *Growing sectors with lower-moderate levels of work organisation quality and lower than average levels of work organisation quality:* The sectors in this group include retail, construction, hotels and restaurants. These growing sectors typically have moderate to low levels of work organisation quality, which is lower than average. The pattern of job resources and job demands is the reverse of that described in the previous group.
- *Declining sectors with upper-moderate levels of work organisation quality and higher than average levels of work organisation quality:* The sector in this group is energy, and it has a moderate to high level of work organisation quality, which is higher than average. The pattern of job resources and job demands is similar to that described in the first group.
- *Declining sectors with lower-moderate levels of work organisation quality and lower than average levels of work organisation quality:* The sectors in this group are transport, manufacturing and agriculture. These declining sectors typically have moderate to low levels of work organisation quality, which is lower than average. The pattern of job resources and job demands is the reverse of that described in the first group.

The general picture from Tangian’s (2007) analysis is that work organisation is, on average, of a moderate quality throughout the EU. Within this general context, there are two groups of service sectors, one comprising growing sectors with above average levels of work organisation quality and one comprising growing sectors of below average work organisation quality, and another group of declining sectors - transport, manufacturing and agriculture - with below average work organisation quality.

Table 2.4: Job Quality by Sector. Absolute Index (Range 0-100)

	All Sectors	Financial Intermediat.	Business	Public Administrat.	Education, Health & Social Work	Retail	Construction	Hotels & Restaurants	Energy	Transport	Manufactur. & Mining	Agriculture
Growth		+	+	+	+	+	+	+	-	-	-	-
Job Quality Indices												
Work Organisation												
Creativity (Job complexity)	64	71	86	67	72	60	60	54	68	61	56	53
Possibilities for influence	56	64	63	58	58	54	55	52	59	52	51	53
Meaningfulness of work	81	83	81	82	87	77	82	76	85	81	79	76
Work intensity	70	70	69	72	74	73	65	67	70	69	63	71
Physical strains	68	82	76	72	67	71	57	62	67	67	63	59
Emotional strains	52	51	54	52	41	50	56	45	56	52	61	67
Industrial culture	54	54	53	57	55	51	59	55	57	51	56	54
Assistance from colleagues	73	74	74	74	76	71	72	71	76	71	71	69
<i>Average of Work Organisation</i>	65	69	70	68	66	63	63	60	67	63	63	63
Wages and Payment system												
Income	55	66	60	58	55	53	56	51	61	58	53	43
Security and Flexibility												
Working time	55	57	55	55	55	52	57	51	56	52	55	55
Job security	66	73	70	70	71	64	61	58	68	65	62	58
Skills and Development												
Qual. and development possibilities	33	42	36	38	40	27	32	23	37	30	31	24
Career chances (in the enterprise)	49	64	56	55	53	46	48	42	54	46	44	33
Collective Agreement and Voice												
Communication and transparency	51	58	51	52	51	46	52	46	57	53	56	46
Quality of management	70	76	70	72	72	70	57	68	73	68	70	66
Total Job Quality	61	67	64	64	62	53	56	51	64	58	53	43

Note: The sectors of education and health and social work are combined, as are manufacturing and mining, and agriculture and fishing. Business = retail estate, renting and other business activities. >80 = very high quality; 70-80 = high quality; 60-70 = moderate quality; 50-60 = inferior quality; < 50 = poor quality.

Table 2.5: Job Quality by Sector. Relative Index

	Financial Intermediation	Business	Public Administration	Education, Health & Social Work	Retail	Construction	Hotels & Restaurants	Energy	Transport	Manufacturing & Mining	Agriculture
Growth	+	+	+	+	+	+	+	-	-	-	-
Job Quality Indices											
Work Organisation											
Creativity (Job complexity)	113	80	55	142	-40	-34	-123	82	-25	-103	-147
Possibilities for influence	155	167	36	27	-52	-19	-1.5	71	-87	-114	-79
Meaningfulness of work	69	-8	30	187	-119	24	-145	113	-9	-63	-80
Work intensity	3	-11	90	137	102	-137	-67	8	-4	-187	66
Physical strains	198	119	62	-24	31	-137	-81	4	-1	-62	-108
Emotional strains	-35	6	-24	-173	-46	55	-113	39	-13	118	186
Industrial culture	17	-49	128	15	-144	191	-44	87	-152	18	-37
Assistance from colleagues	68	42	82	137	-75	-25	-84	139	-54	-61	-170
Wages and Payment system											
Income	171	73	42	2	-49	-1	-79	64	37	-40	-219
Security and Flexibility											
Working time	142	40	30	33	66	44	-207	35	-159	-23	-1
Job security	133	85	95	117	-41	-85	-125	51	-14	-74	-140
Skills and Development											
Qual. and development possibilities	154	53	85	112	-83	-29	-153	59	-33	-37	-128
Career chances (in the enterprise)	176	81	69	45	-40	-15	-86	62	-36	-63	-193
Collective Agreement and Voice											
Communication and transparency	135	-8	-2	40	-126	1	-136	125	16	98	-143
Quality of management	200	-38	62	44	17	-119	-58	96	-94	18	-128
Total Job Quality	65	33	28	13	-14	-19	-54	28	-7	-19	-45

Note: The sectors of education and health and social work are combined, as are manufacturing and mining, and agriculture and fishing. Business = retail estate, renting and other business activities

Greenan et al. (2010) constructed work organisation indices using data from the EWCS 1995, 2000, and 2005. The three work organisation indices were:

- Working conditions, consisting of items pertaining to ergonomic and physical risk factors;
- Technical work intensity, consisting of items pertaining to repetitiveness, working at a high speed and constraints on work pace;
- Work complexity, consisting of items pertaining to complex tasks, job discretion, and the need to learn new things.

Using multi-level analysis and controlling for a range of individual-level factors (i.e., gender, age, contract and occupational role) and country-level factors (i.e., unemployment rate, GDP, and female participation in the work force), they reported on differences in work organisation between five groups of sectors, using manufacturing as the referent. With regard to working conditions, the construction and agricultural sectors had significantly lower working conditions than manufacturing, whereas working conditions were significantly higher in the service sectors (e.g., financial intermediation, business) and public administration. All sectors had significantly lower working intensity than manufacturing; and the level of work intensity in the service and public administration sectors was appreciably lower than in the construction and agriculture sectors. Manufacturing also had the lowest levels of work complexity, although the levels of work complexity in construction and public services were appreciably higher than in service sectors and agriculture. Overall, the general pattern is of service jobs typically having a higher quality of work organisation than manufacturing, construction and agriculture, a pattern evident across ten years from 1995 to 2005.

Valeyre et al. (2009) took a different approach than Tangian (2007) and Greenan et al. (2010) to the analysis of work organisation quality. Valeyre et al. examined different types of work organisation rather than specific indices of work organisation. To identify work organisation types, Valeyre et al. performed a cluster analysis on a range of items from the EWCS 2005 data set that reflected various aspects of work organisation, namely job discretion, task complexity, task monotony, constraints on the pace of work teamwork, task rotation, quality control, problem-solving activity and whether individuals learn new things at work. It is important to note that in their analysis they did not include data from the public sector or from micro-organisations of less than ten employees. Four clusters emerged from the analysis, which they labelled as discretionary learning, lean production, Taylorist and Simple. The levels of work organisation in each cluster were:

- **Discretionary learning** Higher levels of job discretion, learning and problem solving, task complexity, self assessment of quality of work
 Moderate level of autonomous teamwork
 Lower levels of job monotony and work pace constraints
- **Lean production** Higher levels of teamwork, task rotation, self-assessment of quality of work and quality norms,

	demand-driven constraints on work pace, learning and problem solving
	Autonomy only just above the mean level
— Taylorist	Lower levels of job discretion, learning and problem solving, task complexity, assistance from colleagues
	Moderate levels of team work but with little control over task division
	Higher constraints on the pace of work, repetitiveness and quality norms
— Simple	Lower levels on all variables

With regard to the quality of these job types, it can be argued that discretionary learning type has the highest quality of work organisation as it has higher levels of job resources, e.g., job discretion, learning and problem solving job characteristics, and autonomous team work. By the same logic, Taylorist and Simple job types have the lowest levels of work organisation quality, as they encompass lower levels of job resources. Lean production has a mixture of high job resources (e.g., team work, task rotation), high demands (e.g., learning and problem solving) and low job resources (e.g., constraints on the pace of work, moderate levels of job discretion). Lean production might therefore be seen to have a moderate level of work organisation quality, although there is a debate about the extent to which lean production is similar in effect to Taylorist job forms and is therefore of a similar level of quality (e.g., Delbridge, 2005).

Table 2.6: Types of Work Organisation by Sector

Sector	BART	Type of Work Organisation			
		Discretionary Learning	Lean Production	Taylorist	Simple
Business	3.40%	50.5	20.5	10.8	18.3
Construction	2.33%	29.1	35.7	23.0	12.2
Retail	0.62%	39.6	20.4	14.6	25.5
Other service activities	0.55%	48.9	21.3	7.7	22.2
Hotels and restaurants	0.38%	32.5	32.5	26.0	20.8
Financial intermediation	0.03%	63.2	18.9	5.6	12.4
Mining	-0.24%	29.0	29.2	26.4	15.4
Energy	-0.24%	56.3	23.4	8.7	11.6
Transport	-0.34%	33.2	22.0	18.2	26.6
Manufacturing	-3.04%	30.9	30.9	28.7	9.5
<i>Total</i>		<i>38.4</i>	<i>25.7</i>	<i>19.5</i>	<i>16.4</i>

Note: Sectors not included in this analysis: health and social work, education, private households, public administration, extra-territorial organisations and bodies, and agriculture.

Discretionary learning was the most frequent job type comprising 38% of all jobs, whilst the frequencies of other types of job were: lean production, 26%; Taylorist, 20%; and, Simple, 16% (see Table 2.6). Table 2.6 also shows the frequency of job type by sector. From this four groups are evident in relation to growing and declining sectors:

- | | |
|---|--|
| a. <i>Growing</i> sectors with greater frequency of <i>high</i> quality job types | Business, retail, other service activities, financial intermediation |
| b. <i>Growing</i> sectors with greater frequency of <i>low</i> quality job types | Construction, hotels and restaurants |
| c. <i>Declining</i> sectors with greater frequency of <i>high</i> quality job types | Energy |
| d. <i>Declining</i> sectors with greater frequency of <i>low</i> quality job types | Transport, manufacturing, mining, agriculture |

Parent-Thirion et al. (2007) examined sectoral differences across a wide variety of work organisation characteristics but used single items from the EWCS 2005 data set, most of which were the same as used by Tangian (2007), Valeyre et al. (2009) and Greenan et al. (2010). Perhaps unsurprisingly, the general pattern of sectoral differences in work organisation reported by Parent-Thirion et al. (2007) is similar to these other studies.

Whereas the previous four studies included a wide range of work organisation features, other studies reporting on sectoral differences in work organisation have focused specific aspects of work organisation, such as the study by Burchell et al. (2009) on work intensity, and by Joling and Kraan (2008) on technology use. These studies used the EWCS 2005 and report similar patterns of sectoral differences in work organisation to those already mentioned. For example, Joling and Kraan reported that jobs that only use computers are more prevalent in service sectors, while jobs that use machines or machines and computers occur more frequently in the agricultural, manufacturing and construction sectors. Furthermore, computer-only jobs are of a higher quality as they typically have higher levels of job discretion, higher learning opportunities on the job, lower work intensity, and lower ergonomic risks.

In summary, from studies of sectoral difference in work organisation, a general pattern that emerges is that there are two groups of service sectors, one comprising growing sectors with above average levels of work organisation quality (i.e., financial intermediation, business, retail, public administration, education, health and social work) and one comprising growing sectors of below average work organisation quality (i.e., construction, hotels and restaurants). There is also another group of declining sectors, transport, manufacturing and agriculture, which have below average work organisation quality. This pattern is evident when work organisation is measured in different ways, and it would appear that the pattern is consistent across time from 1995 to 2005 and, as such, the sectoral differences in work organisation do not appear to have only emerged in recent years.

2.1.2 Wage and Payment System

The wage and payment system dimension of job quality includes features of the job such as wage level, performance-related pay schemes (e.g., profit sharing, individual and group-based) and additional benefits such as pension contributions and health insurance. High wages are often seen to be indicative of high job quality because receiving a high reward may be both pleasurable in itself and may enable the person to consume more and better goods. However, the effects of performance related pay schemes on employee experiences may not always be positive, and their effects may depend largely on worker preferences and perceptions of their equity. As such, performance-related pay schemes may not always be indicative of job quality.

Fernández-Macias & Hurley (2008) examined sectoral differences in job growth in the EU-15⁵ and NMS-10 across five pay quintiles by combining data from various EU data sources, e.g., the European Labour Force Survey, the European Survey of Income and Living Conditions. From this it was possible to establish whether there had been a change in the number of high or low paid jobs within six groups of sectors. The six sectoral groups and the changes that occurred within them were:

- *Primary industries, i.e., agriculture, fishing and mining.* The EU-15 and NMS-10 experienced job losses across all pay quintiles in these sectors, with the EU-15 losing most jobs in the fourth and fifth quintiles, whilst job losses in the NMS-10 were spread more evenly across all pay quintiles.
- *Construction.* The EU-15 and NMS-10 gained jobs across all pay quintiles, especially in the third quintile.
- *Low-tech manufacturing, e.g., food products and beverages, textiles, publishing, recycling, and energy supply.* The EU-15 and NMS-10 experienced job losses across most quintiles, with job losses occurring mainly in the bottom quintile. The exception to this occurred in the top quintile in the EU-15 and the second quintile in the NMS-10, but the job gains in these quintiles were outweighed by job losses in the other quintiles.
- *High-tech manufacturing, e.g., electrical machinery, television and communication equipment, medical, and precision and optical instruments.* There was a significant difference in growth patterns between the EU-15 and the NMS-10. The EU-15 experienced job losses across all but the top quintile (such that any job gains were outweighed by job losses), while the NMS-10 experienced gains across all quintiles, particularly in the third quintile.
- *Low knowledge intensive services, e.g., wholesale and retail trade, hotels and restaurants, land transport, public administration and defence, and private households.* Job growth occurred across all quintiles in both the EU-15 and NMS-10, with growth being skewed towards the bottom two quintiles in the EU-15 and the top two quintiles in the NMS-10.

⁵ The EU-15 include Austria, Belgium, Germany, Denmark, Greece, Spain, Finland, France, Ireland, Italy, Luxembourg, Netherlands, Portugal, Sweden, United Kingdom; and the NMS-10 include Czech Republic, Cyprus, Estonia, Hungary, Lithuania, Latvia, Malta, Poland, Slovenia, Slovakia.

- Knowledge intensive services, e.g., *water and air transport, telecommunications, financial intermediation, real estate activities, research and development, education, and health and social work*. Job growth occurred across all quintiles in both the EU-15 and NMS-10, with growth being skewed towards the top two quintiles in the EU-15 and the top quintile in the NMS-10.

There are a number of interesting observations that can be made from the above. All EU countries are losing low and high paid jobs in the primary sectors. All EU countries are also losing low paid jobs in manufacturing but whereas the EU-15 are gaining low- and high-tech manufacturing jobs in the top pay quintile, the NMS-10 are gaining jobs in the second pay quintile of low tech manufacturing and mainly in the third quintile of high-tech manufacturing. There is also a difference between the EU-15 and the NMS-10 in the growth of services. Growth in low- and high- knowledge services is polarised in the EU-15, with growth in the bottom two quintiles in low-knowledge services and in the top two quintiles in high-knowledge services, whereas in the NMS-10 growth is highest in the top-two quintiles across both low- and high-knowledge services.

Tangian's (2007) pay quality index included items on wage level harmonized into ten deciles and employees' perceptions of pay fairness. Tangian's analysis suggests that the financial intermediation, business and energy sectors have moderate levels of pay quality (see Table 2.4), and that all other sectors had poor pay quality, except agriculture which had inferior pay quality. However, given that these job quality bands are not sufficiently justified by Tangian, it is probably safer to focus on relative levels. With regard to relative levels of pay quality (see Tables 2.4 and 2.5), the results indicate that pay quality was higher in the service sectors of financial intermediation, business, public administration and transport and energy, was at an average level in the education and construction sectors, and was lower than average in agriculture, manufacturing, hotels and restaurants, and retail.

Although the studies by Fernández-Macias and Hurley (2008) and Tangian (2007) point to the differences between sectors, these sectoral variations might be due to differences in other factors such as gender balance or occupational level. Parent-Thirion et al. (2007) reported an analysis of EWCS 2005 data that compared the level of pay amongst sectoral groups, with manufacturing as the referent. The analysis controlled for gender, educational level, occupational level, tenure, company size and type of contract. The results showed that wage levels in agriculture, construction and transport were all significantly lower than in manufacturing. In contrast, wage levels in financial intermediation and real estate, public administration and education were all significantly higher than in manufacturing. There was no significant difference between manufacturing and retail (see also: Du Caju, Kátay, Lamo, Nicolitsas & Poelhekke, 2010 for similar conclusions using data from the Structure of Earnings Survey, albeit from a more limited range of EU countries).

The general picture from these studies is that there has been an expansion of jobs with high pay in manufacturing in the EU-15, of jobs with average pay in construction in all EU countries and in manufacturing in the NMS-10, and of high and low paid jobs in services sectors across all EU countries. Hence most low paid jobs have been created

within the service sectors, although from current data it is not possible to pinpoint in which service sectors the most low paid jobs have been created. There has also been a decline in jobs of high and low pay quality in agriculture, and a decline in jobs of low pay in manufacturing, particularly in the EU-15.

With regard to performance related pay schemes, Riedman, Van Gyes, Román, Kerkhofs, & Bechman (2010) found that the sectors with the highest use of individual performance related pay schemes were financial intermediation, business and retail (i.e., between 40 and 60% in each sector). Companies in these sectors also reported higher use of profit sharing schemes. We were unable to find studies that reported on the extent of sectoral differences in other work benefits such as pension contributions or health insurance.

2.1.3 Security and Flexibility

Job security and job flexibility are typically considered to be two key dimensions of job quality. Job security is often considered in relation to job flexibility because a key aim of the European Employment Strategy is to promote flexible employment markets in which employees also have high levels of job security, a combination commonly referred to as ‘flexicurity’ (Wilthagen and Tros, 2004). Such a combination is considered to be advantageous, as high job security is thought to offset some of the potential problems and risks associated with high-levels of flexibility. This section reviews the literature on sectoral differences in job security, job flexibility, and flexicurity.

Job Security

There are three key forms of job-related security: (1) job security, i.e., the security of tenure in relation to a specific job; (2) employment security, i.e., the security of having a job; and; (3) income security, i.e., the security of income when ill or unemployed (Pacelli et al., 2008; Standing, 1999). Jobs with higher levels of security are typically seen to have a higher level of quality, as security reduces feelings of uncertainty and anxiety (De Witte, 1999).

Pacelli et al., (2008) examined job security using a job security index based on tenure-related items from the EWCS 2005⁶ as well as an item concerning employees’ perceptions of job security. They argued that employees in occupations and sectors with low tenure might be considered less secure, and provided evidence for this by showing a positive correlation of .93 between the index of tenure-related job security and a measure of employees’ perceptions of job security. The sectors with the highest level of job security were, in rank order:

	<i>Job Security Index</i>
— Public administration	86
— Education, health and social work	82
— Energy	73

⁶ Note that the items are not stated.

— Transport	62
— Financial intermediation	59
— Manufacturing	56
— Business	39
— Construction	33
— Other services	26
— Hotels and restaurants	17
— Agriculture	17
<i>Average</i>	53

From Pacelli et al.'s (2008) analysis it is evident that job security is low in the two sectors with greatest growth, i.e., business and construction, as well as in two additional growing sectors, i.e., other community and personal services, and hotels and restaurants. Job security is high in the growing sectors of public administration and education, health and social work, and above average in three declining sectors, namely energy, transport and manufacturing.

A similar analysis to Pacelli et al. (2008) was conducted by Tangian (2007) who created a job security index from items in the EWCS 2005 that concerned perceptions of the risk of losing one's job and whether employees would have the ability to work after they were 60 years old. The results in Table 2.4 indicate that most sectors have jobs with moderate or high job security, while the relative differences in job security (see Table 2.5) between sectors are as follows:

- | | |
|--|--|
| a. <i>Growing</i> sectors with relatively <i>high</i> job security | Financial intermediation, business, public administration, education, health and social work |
| b. <i>Growing</i> sectors with relatively <i>low</i> job security | Retail, construction, hotels and restaurants |
| c. <i>Declining</i> sectors with relatively <i>high</i> job security | Energy |
| d. <i>Declining</i> sectors with relatively <i>low</i> job security | Transport, manufacturing and mining, agriculture |

Although the pattern of sectoral differences in Tangian's (2007) study is broadly similar to that in Pacelli et al.'s (2008) (a key difference being the business sector), the results from Tangian's absolute index of job security suggest that sectoral differences are much less than that suggested by the results of Pacelli et al.'s study.

The presence of a permanent contract is often viewed as an indicator of job security. However, we were unable to find literature that reported the frequency by sector of employees with permanent or temporary contracts⁷.

Job Flexibility

Two key forms of organisational flexibility are: (1) external numerical flexibility, i.e., an organisation's ability to respond to changes in demand by through fixed-term employment contracts, subcontracting or recruitment, and; (2) internal numerical flexibility, i.e., an organisation's ability to respond to changes in demand through varying working hours available⁸. At the level of the job, flexibility is expressed in terms of temporary contracts, part-time contracts, working time arrangements (e.g., overtime, night and evening work, shifts) and flexible working arrangements (e.g., flexible leave, working time accounts). Some flexible working practices, such as excessive overtime or long working hours, are often considered to be indicative of low job quality because they are associated with lower physical and psychological well-being. Other working practices may be preferred by some (e.g., part-time work) but not others hence will have a less straightforward relationship with job quality.

Organisations use different combinations of flexible working practices. Chung, Kerkhofs and Ester (2007) found that organisations typically combine flexible practices in one of six ways⁹. The six types of flexibility, detailed in Table 2.7, differ primarily with regard to the extent to which flexible working practices are used (i.e., high, intermediate and low), the extent to which flexibility is used to primarily meet the needs of the company (e.g., company-orientated, day-to-day types of flexibility, overtime) or the needs of the employee and company (e.g., worker orientated, life-course), and the extent to which atypical working time arrangements (e.g., evening work, night work, shift work) are used.

Chung et al. (2007) found sectoral differences in the use of these types of job flexibility. Worker-orientated job flexibility was more likely to be found in financial intermediation, business and public administration, whilst company-orientated job flexibility was more likely to be found in health and social work, and transport. For intermediate levels of job flexibility, life-course job flexibility was more likely to occur in education, and day-to-day job flexibility was more likely to occur in hotels and restaurants and other services, while over-time only job flexibility was more likely to occur in manufacturing and transport. Low job flexibility was more likely to occur in construction and manufacturing. The work of Chung and colleagues therefore suggests that growing sectors of the economy are characterised by high-levels of flexibility (e.g., business services, health and social work), intermediate levels of flexibility (e.g., hotels) and low flexibility (e.g., construction), while

⁷ The general picture is that, while more people are employed on permanent contracts (86%) than temporary contracts the number of jobs in the EU-27 with a permanent contract grew by 5.4% from 2000-2007 while the number of temporary jobs grew by 24.8% in this period (Employment in Europe, 2008).

⁸ Other forms of flexibility include functional flexibility, i.e., the flexibility in work roles, and financial flexibility, i.e., ability to alter pay levels. These forms of flexibility are covered, respectively, in the sections on work organisation and payment systems.

⁹ Chung et al. (2007) used the EU Establishment Survey on Working Time 2004-2005.

contracting sectors are characterised by a high level of flexibility in the transport and energy sectors and intermediate flexibility in the manufacturing sector.

Other studies have examined flexible working practices individually rather than in combination. Anxo, Fagan, Smith, Letablier and Perraudin (2007) examined the proportion of companies using part-time work, while Parent-Thirion et al. (2007) examined the proportion of employees reporting part-time contracts. The results of these studies are shown in Table 2.8 and demonstrate that growing sectors of the economy with higher than average use of part-time work include Education, Health and Social Work, Other Services, Hotels and Restaurants and Financial Intermediation; and that a growing sector of the economy with lower than average use of part-time work is Construction. Declining sectors with lower than average use of part-time work includes Energy, Manufacturing, Transport and Agriculture. Overall, the greater use of part-time work across a wide variety of growing service sectors, and the lower use of part-time work across many declining sectors may partly explain why the number of jobs created from 2000-2007 with full-time contracts grew by 4.7% but the number created with part-time jobs grew by 17.7% (Employment in Europe, 2008)¹⁰.

Table 2.7: Types of Flexibility in EU Companies

Flexibility Type	Above Average Use of Flexible Job Features	Sector	% of comp.
High			
Worker orientated	Part-time work Flexible work hours Overtime Leave for parental and caring duties Early retirement option Fixed term, flexible and temporary contracts	Financial intermediation Business Public administration Energy Other services	14
Company orientated	Similar to Worker orientated But instead of above average use of flexible working hours, there is above average use of atypical work hours, e.g., evening work, night work, shifts.	Health and social work Transport	22
Intermediate			
Life-course	Part-time work Leave for parental and caring duties Early retirement option	Education	18
Day-to-Day	Part-time work Flexible work hours Atypical work hours	Hotels and restaurants	7
Overtime only	Overtime	Manufacturing	18
Low	No above average use of any practice	Construction	21

¹⁰ It is worth noting that the link between part-time work and service work is not consistent across Europe (Wagner, 2005).

Table 2.8: Part-Time Work in the EU-27: Company and Employee Data

	% Companies with Part-Time Workers ¹	% Employees with Part-Time Contract ²	% Companies offering Flexible Working Arrangements ³
Education	93	>20	46
Health and social work	90	>20	55
Other community and personal services	79	>20	69
Hotels and restaurants	74	>20	63
Financial intermediation	74	10-20	69
Business	66	10-20	70
Public administration	63	10	63
Wholesale and retail	61	10-20	54
Manufacturing	54	10	52
Energy supply	54	5	52
Transport	51	10	52
Construction	42	<5	43
Agriculture	n.d	10	n.d
<i>Average</i>	<i>64</i>	<i>17</i>	<i>56</i>

¹ From Anxo et al., (2007).

² From Parent-Thirion et al. (2007) (as the data is presented graphically it is not possible to provide exact figures).

³ From Riedman et al. (2010). Note that 'n.d' = no data.

Job flexibility also includes flexible working arrangements such as working time accounts (e.g., taking off accumulated hours) and flexible start and finish times. The frequency of companies that use at least one of these practices is shown in the third column of Table 2.8 (Riedman et al., 2010), from which it is clear that the use of flexible working time arrangements are more prevalent in certain growing sectors, i.e., business, financial intermediation, other services, hotels and restaurants, and public administration, and are much less prevalent in the growing sectors of education and construction. Flexible working time arrangements are also relatively less prevalent in the declining sectors of transport, manufacturing, and energy.

Table 2.9: Atypical Working Time Arrangements: Company and Employee Reports

	% Employees >10 hrs per Day ¹	% Employees Evening Work ¹	% Employees Night Work ¹	% Employees Shift Work ¹	% Companies with Part-Time Workers with Flexible Working Hrs on Demand ²
Hotels and restaurants	28.5	>50	>30	29.9	63
Transport	25.2	>50	>30	24.1	40
Health and social work	15.3	>50	>30	35.5	43
Agriculture	43.6	>50	10-20	4.5	n.d
Manufacturing	12.9	40-50	20-30	25.8	28
Other services	-	40-50	10-20	-	43
Business	18.8	40-50	10-20	9.5	34
Retail	15.2	40-50	10-20	16.3	33
Energy	14.7	30-40	20-30	17.4	28
Public administration	14.9	30-40	20-30	17.7	33
Construction	16.6	30-40	10-20	5.3	29
Financial intermediation	13.6	30-40	<10	6.2	36
Education	8.8	30-40	<10	8.0	30
<i>Average</i>	<i>16.9</i>	<i>-</i>	<i>-</i>	<i>17.3</i>	<i>35</i>

¹ From Parent-Thirion et al. (2007) (as the data is sometimes presented graphically in this report, it is not always possible to provide exact figures).

² From Riedman et al. (2010).

Note that 'n.d' = no data.

Atypical working time arrangements are another aspect of job flexibility and include long working hours, evening and night work, and shift work. Table 2.9 shows, for each main sector, the percentage of employees who, in the last month, worked for more than ten hours on one or more days, for one or more evenings, or for one or more nights in the last month. Table 2.9 also shows the proportion of employees who work shifts and the proportion of companies whose part-time employees work flexible hours on demand. The figures in Table 2.9 show that growing sectors of the economy with above average use of atypical working time arrangements include hotels and restaurants and health and social work. Companies in these sectors are also more likely to require their part-time employees to work flexible hours on demand. Growing sectors of the economy with lower than average use of atypical working time arrangements include construction, financial intermediation and education. Declining sectors tended to make higher than average use

of atypical working practices, and such sectors included manufacturing, transport and agriculture.

By considering all the findings from the sectoral analyses of job flexibility at both the employee and company-level, it can be suggested that different types of job flexibility occur in declining and growing sectors. This is summarised in Table 2.10. 'Atypical Working Time Flexibility', i.e., the higher use of atypical working time arrangements, characterises the type of flexibility typically found in the declining sectors of manufacturing, transport and energy. 'Low Flexibility', i.e., where little use is made of any flexible working practice, characterises the type of flexibility typically found in the growing sector of construction. 'Company-Orientated Flexibility', i.e., the high use of all types of flexible working practice and in particular the high use of atypical working time arrangement, characterises the type of flexibility typically found in the growing sectors of hotel and restaurants, and health and social work. 'Employee-Orientated Flexibility', i.e., the higher use of part-time work and flexible working arrangements, characterises the type of flexibility typically found in the growing sectors of public administration, financial intermediation, business, education, and retail.

Table 2.10: Summary of Job Flexibility in Growing and Declining Sectors

	Atypical Working Time	Part-Time	Flexible Working Arrangements
<i>Declining</i>			
<i>Atypical working time flexibility</i> e.g., Manufacturing, transport, energy	High	Low	Low to Moderate
<i>Growing</i>			
<i>Low flexibility</i> e.g., Construction	Low	Low	Low
<i>Company-orientated flexibility</i> e.g., Hotel and restaurants, health and social work	High	High	High
<i>Employee-orientated flexibility</i> e.g., Public administration, financial intermediation, business, education, retail	Low	High	High

Flexicurity

Flexicurity concerns the extent to which employment markets combine flexibility with job security. At the level of the job, flexicurity is expressed as the extent to which a job combines high levels of job flexibility and job security. We were unable to find a sectoral analysis of flexicurity but by integrating the findings from our review of job security and job flexibility, we can tentatively suggest that sectors can be characterised at having one of five combinations of job security and flexibility. This is summarised in Table 2.11. Thus, growing sectors with a high level of job flexicurity include financial intermediation, business, public administration, education, and health and social work. This is not typical

of all the growing sectors however, as two growing sectors, hotels and restaurants and retail, offer jobs with high flexibility and low security; here, the possible risks of flexibility are not offset by the benefits of job security. The growing construction sector has both low flexibility and low security such that employees may not gain any of the potential benefits from either job flexibility or job security. In addition, none of the declining sectors of the economy are found to have a high level of job flexicurity (i.e., high job flexibility and security).

Table 2.11: Sectoral Combinations of Job Security and Job Flexibility

Job Flexibility/Security Combination	Sector
<i>Declining</i>	
Moderate Flexibility/High Security	Energy
Moderate Flexibility/Low Security	Manufacturing, transport
<i>Growing</i>	
High Flexibility/High Security	Financial intermediation, business, public administration, education, health and social work
High Flexibility/Low Security	Hotels and restaurants, retail
Low Flexibility/Low Security	Construction

2.1.4 Skills and Development

The skills and development dimension of job quality consists of four areas. The first of these concerns the skill requirement of the job. The second area, job learning characteristics, concerns the extent to which the job task uses existing skills, requires that the employee develop new skills, and offers the opportunity to develop new skills. Skill requirements and the level of job learning characteristics are likely to depend on the complexity of the job task. Another important job learning characteristic is the extent to which the skills of the employee match the skills required by the job. The third area is training, the extent to which the job provides formal skill development activities. The fourth area, career development, concerns the extent to which a job offers the potential for career progression.

These four areas can affect employee well-being and thus contribute to job quality. Jobs with higher skill requirements are likely to involve tasks that are complex and wide in scope and as a result tend to be experienced as intrinsically motivating (Parker & Wall, 1999). Jobs with more learning characteristics are also likely to be associated with higher well-being (Holman & Wall, 2002). For example, jobs that provide the opportunity to learn new skills and knowledge may increase mastery experiences and enable the employee to cope better with job demands, both of which will contribute to higher psychological well-being (Bandura, 1997; Frese & Zapf, 1994). The match between an employee's skills and those required by the job can also have an important effect on employee work experiences, and can include skill underutilization, when the employee's skills are not used in the job, and skill overutilization, when the employee does not have the skills to do

the job. Skill underutilization has been identified as a particular problem, having been associated with higher levels of boredom and depression, as well as a decline in cognitive ability (De Grip, Bosma, Willems & Van Boxtel, 2008; Holman & Wall, 2002; O'Brien, 1986).

European-wide studies of skill requirements that report on sectoral differences are rather rare. A study by Lyly-Yrjänäinen (2008) used data from the EWCS (EWCS, 2005; Parent-Thirion et al., 2007) and the Labour Force Survey (2005) to examine the frequencies of jobs in the EU-27 with low skill requirements. The education level of an employee was used as a proxy for job skills, the argument being that employees with low levels of education are more likely to be selected for low skilled jobs¹¹. Low qualified workers are defined as employees with basic educational levels (ISCED 0 = pre-primary education; 1 = primary education or first stage primary education; 2 = lower secondary or secondary stage of basic education) Table 2.12 shows that relatively low levels of low qualified workers are found in five growing sectors, i.e., financial intermediation, education, public administration, health and social work, and business. From this it could be argued that these sectors have jobs with relatively higher skill requirements. These sectors are also those in which a higher than average proportion of employees report that their job involves learning new things (Parent-Thirion et al., 2007). Another interesting feature of these sectors is that, although a higher than average proportion of employees in these sectors had received training in the last year (with the exception of the business sector), a higher than average proportion also reported that they needed further training, an indicator of skill overutilization (Employment in Europe, 2007). In sum, this group could be labelled as growing high-learning quality sectors.

In contrast, relatively high levels of low qualified workers are found in three growing sectors, hotels and restaurants, construction and retail. This suggests that these sectors have relatively low skill requirements. Table 2.12 also indicates that these sectors have a lower than average proportion of employees reporting that their job involves learning new things, and that although a lower than average proportion of employees received training in the last year, a lower than average proportion also reported that they needed further training (Parent-Thirion et al., 2007). In sum, these sectors could be labelled as growing low-learning quality sectors. A similar pattern of skill requirements, job learning characteristics, training and skill underutilization is found in the declining sectors of transport, agriculture and manufacturing; this group could be labelled as declining low-quality learning sectors.

Tangian (2007) used an index of training and development quality labelled 'Qualification and Development Possibilities', that included the same items from the EWCS 2005 as mentioned in Table 2.12, plus other items concerning whether an employee had received on the job training and other forms of training at work. The results (see Tables 2.4 and 2.5) suggest the training and development quality across all sectors is poor but that the

¹¹ A more typical proxy for skill requirements is to use ISCO job titles, e.g., service workers, shop workers, agricultural workers. But as many of these are job titles are sector specific, sectoral comparisons using job titles as a proxy for job skill requirements are problematic.

level of quality is better in some sectors than others. In particular there appear to be four groups of sectors with regard to learning quality which are similar to those reported earlier, e.g., a group of growing high-learning quality sectors etc.

Tangian (2007) also examined career development opportunities afforded by the job using an index that included items on whether the job offered good prospects for career advancement and whether the job provided opportunities to grow and develop at work. The results in Tables 2.4 and 2.5 suggest four groups of sectors: (1) growing sectors with inferior to moderate levels of career development quality, i.e., financial intermediation, education, public administration, health and social work, and business; (2) a declining sector with inferior levels of career development quality, i.e., energy; (3) growing sectors with poor career development quality, i.e., hotels and restaurants, construction, and retail; and (4) declining sectors with poor career development quality, i.e., transport, agriculture, and manufacturing.

Table 2.12: Aspects of Job Skill Requirements, Learning Characteristics and Training by Sector

	% Employees Low Qualified ¹	% Job Involves Learning New Things ²	% Further Training to Cope Well with Duties ²	% Duties Match Skills ²	% Skills to Cope with More Demanding Duties ²	% Training Paid by Employer in Last Year ²
Growing High-Learning Quality Sectors						
Financial intermediation	1	85.4	15.4	51.8	32.8	42.8
Education	2	84.4	19.8	49.4	30.8	42.0
Public administration	4	77.8	16.3	50.3	33.5	42.6
Health and social work	6	83.0	19.6	51.0	29.4	40.8
Business	6	76.3	14.8	50.2	35.1	26.2
Declining High-Learning Quality Sectors						
Energy	1	83.6	14.9	49.7	35.3	35.5
Growing Low-Learning Quality Sectors						
Hotels and restaurants	6	53.6	5.7	57.4	36.9	11.9
Construction	11	43.2	12.7	54.8	37.5	18.5
Retail	16	58.7	10.1	52.9	37.0	20.3
Declining Low-Learning Quality Sectors						
Transport	6	59.5	9.0	53.4	37.6	28.2
Agriculture	12	58.0	9.1	55.9	35.0	7.9
Manufacturing	20	67.1	12.3	51.8	35.9	22.4
<i>Average</i>	-	<i>69.1</i>	<i>13.1</i>	<i>52.3</i>	<i>34.6</i>	<i>26.1</i>

¹ From Lyly-Yrjänäinen (2008) (as the data is sometimes presented graphically in this report, it is not always possible to provide exact figures)

² From Parent-Thirion et al. (2007).

Table 2.13: Aspects of Collective Representation and Voice

	% Consulted about Changes ¹	% Informed about Health and Safety Risks ¹	% Contact with Employee Representative ¹
Education	56.8	82.5	25-30
Health and social work	56.2	88.8	25-30
Financial intermediation	55.5	85.2	15-20
Public administration	49.9	85.3	25-30
Business	49.5	52.3	15-20
Transport	48.6	82.0	25-30
Energy	47.7	87.7	25-30
Hotels and restaurants	45.2	78.9	15-20
Retail	44.8	82.7	15-20
Manufacturing	43.4	84.5	20-25
Agriculture	42.9	76.5	20-25
Construction	41.8	84.5	15-20
<i>Average</i>	<i>47.1</i>	<i>83.1</i>	-

¹ From Parent-Thirion et al. (2007).

2.1.5 Collective Representation and Voice

The collective representation and voice dimension of job quality concerns features of the job such as the level of employee participation, employee involvement in workplace representation (e.g., trade unions), the relationship between employees and managers, the relationship between employees and workplace representatives, and communication practices. Jobs are typically seen to be of a higher quality when the employee has the opportunity to influence and participate in decisions about the organisation, has positive and constructive relationships with management and others, and is informed about organisational plans and important features of the job, e.g., health and safety risks. Higher levels of participation, positive social relationships with management and informative communication are generally associated with higher levels of employee well-being (Jackson, 1983).

Only a few studies have examined sectoral differences in collective representation and voice within Europe. Parent-Thirion et al. (2007) reported the results for three items from the EWCS 2005 on consultation and communication, and each item had a different pattern of sectoral difference. The first item concerned whether the employee was

consulted on changes to work organisation and the results, shown in Table 2.13, suggest four groups:

- | | |
|---|--|
| a. <i>Growing</i> sectors with higher than average consultation | Financial intermediation, business, public administration, education, and health and social work |
| b. <i>Growing</i> sectors with lower than average consultation | Retail, construction, and hotels and restaurants |
| c. <i>Declining</i> sectors with higher than average consultation | Energy, transport |
| d. <i>Declining</i> sectors with lower than average consultation | Manufacturing, agriculture |

The second item concerned employees' perceptions of the availability of information about health and safety risks. The results in Table 2.13 show that a large majority of all employees across all sectors report that they are well informed about health and safety risks, and only two sectors, agriculture and hotels and restaurants, had scores that were much lower than the average. The third item concerned whether employees had contact with employee representatives about work-related problems. The results indicate the following groups of sectors: (1) growing sectors with relatively high contact, i.e., education, health and social work, and public administration; (2) growing sectors with relatively low contact, i.e., financial intermediation, business, hotels and restaurants, retail, and construction; (3) declining sectors with relatively high contact, i.e., transport and energy, and; (4) declining sectors with relatively moderate levels of contact, i.e., manufacturing and agriculture.

These results are similar to the findings reported by Riedman et al. (2010) at the company-level who found that there was a greater likelihood of an employee representative being present in companies in manufacturing and not-for-profit service sectors (e.g., health and social work, education) than in companies in private service sectors (e.g., finance, business, hotels and restaurants, retail).

Tangian (2007) created a 'Communication and Transparency' index that included the three items from the EWCS 2005 examined individually by Parent-Thirion et al. (2007) plus items concerning how the employee was assessed at work, e.g., the use of numerical targets and performance-related pay¹². The absolute index (see Table 2.4) of communication and transparency indicates that most sectors are of a poor quality with regard to this aspect of the job. But there are differences between sectors, which are:

- | | |
|--|--|
| a. <i>Growing</i> sectors with higher than average communication quality | Financial intermediation, business, public administration, education, health and social work |
| b. <i>Growing</i> sectors with lower than average communication quality | Retail, construction, hotels and restaurants |

¹² The differences between the results of Tangian (2007) and Pacelli et al. (2008) probably result from the different measures used.

- | | |
|---|----------------------------|
| c. <i>Declining</i> sectors with <i>higher than average</i> communication quality | Energy, transport |
| d. <i>Declining</i> sectors with <i>lower than average</i> communication quality | Manufacturing, agriculture |

Tangian also created a 'Quality of Management' index that included items on whether the employee had frank discussions with their manager about their performance and work-related problems as well as other items concerning the planning activities of their manager. Employees rated the quality of management as high to very high across all sectors (see Table 2.4), the only exception to this being in construction. The differences between growing and declining sectors that are present with regard to other dimensions of job quality are not so evident in this dimension.

In summary, an interesting feature of this dimension of job quality is that there is not the same pattern or degree of consistency in sectoral differences as is found in other dimensions of job quality. For example, certain sectors that scored relatively higher in terms of consultation, scored relatively lower in terms of contact with an employee representative, e.g., finance. This is in contrast to other dimensions of job quality where sectoral differences are more consistent across different aspects of a particular dimension. It can also be noted that some key aspects of collective representation and voice, such as employee participation and involvement in decision-making, have not been analysed in terms of sectoral differences.

2.2 General Levels of Job Quality between Sectors

The only study we could find that reported sectoral differences in the general level of job quality was by Tangian (2007). Tangian created an absolute general job quality score, which was the mean of fifteen absolute indexes of various aspects of job quality (see Table 2.14). Recall that these indexes were a simple sum of standardized items. Tangian suggested that general job quality scores above 80 represent very high job quality, scores from 70 to 80 represent high job quality, from 60 to 70 represent moderate job quality, from 50 to 60 represent inferior job quality, and scores below 50 represent poor job quality. No justification for these bands was offered, however. Tangian also created a relative job quality score, which was the mean of fifteen relative indexes of various aspects of job quality. Recall that these indexes were created using a method in which each item was standardized such that the mean was zero and the standard deviation was equal to one. This process relativizes good and bad values such that scores can only be used to establish the relative difference between sectors and cannot be used to infer the absolute levels of job quality in any one sector.

The absolute general job quality scores from Tangian (2007) are displayed in Table 2.14. The results for the absolute general job quality scores indicate that there are two groups of sectors with moderate levels of job quality. Of these two groups, one includes growing sectors (i.e., financial intermediation, business, public administration, education, health and social work) and the other includes a declining sector (i.e., energy). There are also two groups with inferior job quality, one that includes growing sectors (i.e., retail,

construction, hotels and restaurants) and one that includes declining sectors (i.e., transport, manufacturing, agriculture). The relative general job quality scores from Tangian are displayed in Table 2.14, and show a similar pattern of sectoral grouping to that found for the absolute general job quality scores.

In addition to this quantitative assessment of relative differences in sectoral job quality based on the study of Tangian (2007), a qualitative assessment of relative differences in sectoral job quality can be undertaken by reviewing the results from the numerous studies discussed earlier. This qualitative review is summarised in the left-hand columns of Table 2.14. Importantly, it confirms the general picture of sectoral differences in job quality as found by Tangian.

Table 2.14: Overview of Dimensions of Job Quality in each Sector

	Relative Level of Job Quality						Tangian Total Job Quality Score	
	Work Organisation	Payment System	Security & Flexibility		Skills & Development	Collective Rep. & Voice	Relative Score ¹	Absolute Score ²
			Security	Flexibility				
Growing, Higher Job Quality Sectors								
<i>Financial intermediation</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>Avg.</i>	65	67
<i>Business</i>	<i>High</i>	<i>High</i>	<i>Avg.</i>	<i>High</i>	<i>High</i>	<i>Low</i>	33	64
<i>Public administration</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>Avg.</i>	28	64
<i>Education</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High/Avg.</i>	13 ³	62 ³
<i>Health and social work</i>	<i>High</i>	<i>Avg.</i>	<i>High</i>	<i>Avg./High</i>	<i>High</i>	<i>High</i>	13 ³	62 ³
Declining, Higher Job Quality Sectors								
Energy	High	High	High	Avg.	High	High	28	64
Growing, Lower Job Quality Sectors								
Retail	Average	Avg.	Low	High	Low	Low	-14	59
Construction	Low/Avg.	Avg.	Low	Low	Low	Low/Avg.	-49	59
Hotels and restaurants	Low	Low	Low	Avg./High	Low	Low	-54	55
Declining, Lower Job Quality Sectors								
Transport	Low	Low/Avg.	Low	Avg.	Low	Avg.	-7	60
Manufacturing	Low	Avg.	Low	Avg.	Low	Avg.	-19	59
Agriculture	Low	Low	Low	Low/Avg.	Low	Low	-45	56

¹ Relative Index, OECD scoring method: Mean = 0, 1 SD = 100;

² Absolute index, HBS method: Range 1 to 100, > 80 = very high quality, 70-80 = high quality, 60-70 = moderate quality, 50-60= inferior quality, < 50 = poor quality.

³ Note that Tangian (2007) combines education with health and social work in his sectoral analysis; hence the score given is the same for both of these sectors.

2.3 Sectoral Differences in Outcomes of Job Quality

Few studies report sectoral differences in job quality outcomes. The only study we could locate is by Parent-Thirion et al. (2007). Using data from the EWCS 2005, this study reported sectoral differences with regard to a range of physical and psychological aspects of well-being. In Table 2.15 we show the sectoral scores for the percentage of employees who reported that work affected their health, and the proportion of employees reporting that work affected health in the following areas: muscular pains, stress, fatigue and anxiety.

Most of the sectors with average or higher than average levels of employee well-being are defined as private service sectors, i.e., hotels and restaurants, wholesale and retail, business, financial intermediation, with the main exception being public administration. Those sectors with lower than average levels of well-being include agriculture, manufacturing, construction and transport, as well as the predominantly public sectors of health and social work, and education.

With regard to differences in well-being between growing and declining sectors, there are five different groups of sectors. They are; (1) declining sectors with lower well-being, i.e., agriculture, manufacturing, and transport; (2) growing sectors with lower well-being, i.e., construction, health and social work, and education; (3) declining sectors with average well-being, i.e., energy; (4) growing sectors with average well-being, i.e., hotels and restaurants; and (5) growing sectors with higher well-being, i.e., public administration, retail, business, and financial intermediation.

For many sectors, the level of well-being equates to that which might be expected to occur based on the level of job quality in that sector, i.e., employees in sectors with higher job quality report higher levels of well-being. This occurs with regard to the business, financial intermediation, and public administration sectors, which have higher job quality and well-being, as well as in the agriculture, manufacturing, construction and transport sectors, which have lower job quality and well-being. But there are some anomalies, i.e., sectors where the level of well-being does not equate to that which might be expected to occur based on the level of job quality in that sector. For example, both the hotels and restaurants and the retail sectors have lower levels of job quality but have, respectively, average and higher than average levels of employee well-being. Similarly, the health and social work, and education sectors, have higher levels of job quality but have lower than average levels of employee well-being. This suggests that these sectors may have particular job features that combine synergistically to effect well-being in a positive or negative manner.

Table 2.15: Employee Well-Being by Sector

	% Work Affects Health	% Muscular Pain	% Stress	% Fatigue	% Anxiety
Lower Well-Being, Declining Sector					
Agriculture	61.4	50.5	30.0	49.0	10.3
Manufacturing	39.7	25.5	23.8	25.5	7.6
Transport	37.9	24.7	24.7	23.7	7.0
Lower Well-Being, Growing Sector					
Construction	44.3	32.5	22.9	28.7	6.1
Health and social work	39.1	24.3	29.4	25.0	11.4
Education	35.7	15.9	28.5	23.6	13.7
Average Well-Being, Declining Sector					
Energy supply	33.9	25.6	22.9	23.1	7.2
Average Well-Being, Growing Sector					
Hotels and restaurants	33.2	20.4	23.2	23.0	7.3
Higher Well-Being, Growing Sector					
Public administration	30.6	17.2	22.6	18.2	10.9
Wholesale and retail	27.6	18.1	16.5	15.9	5.0
Business	26.9	15.3	18.4	13.9	8.0
Financial intermediation	21.2	11.7	14.7	13.9	6.0
<i>EU-27 Average</i>	<i>35.4</i>	<i>22.8</i>	<i>22.3</i>	<i>22.5</i>	<i>7.8</i>

2.4 Summary

The first aim of this report was to review the current literature on job quality in growing and declining sectors within the EU. The strongest conclusions can be made with regard to the evidence on relative levels of job quality between sectors, which suggests that four groups of sectors exist with regard to sectoral growth and relative levels of job quality. They are:

- | | |
|---|--|
| a. Growing sectors with higher than average job quality | Financial intermediation, business, public administration, education, health and social work |
| b. Growing sectors with lower than average job quality | Retail, construction, hotels and restaurants |
| c. Declining sectors with higher than average job quality | Energy |
| d. Declining sectors with lower than average job quality | Manufacturing, agriculture, transport |

This general pattern of differences in the relative levels of job quality was repeated across four of the main dimensions of job quality, namely work organisation, wage and payment system, skills and development, and security and flexibility. The pattern was less evident with regard to one dimension of job quality, namely, collective representation and voice. A further interesting feature is the difference in the nature of job quality between the groups with relatively lower levels of job quality. The growing sectors with lower levels of job quality (i.e., retail, construction, hotels and restaurants) tended to have higher levels of job flexibility and lower levels of collective representation and voice than the declining sectors with lower levels of job quality (i.e., manufacturing, agriculture, transport).

With regard to differences in job outcomes it can be tentatively suggested that there are five groups of sectors. They are:

- | | |
|---|---|
| a. Growing sectors with higher than average well-being | Public administration, retail, business, financial intermediation |
| b. Growing sectors with average well-being | Hotels and restaurants |
| c. Growing sectors with lower than average well-being | Construction, health and social work, education |
| d. Declining sectors with average well-being | Energy |
| e. Declining sectors with lower than average well-being | Agriculture, manufacturing, transport |

For most sectors, the level of well-being equates to that which might be expected to occur based on the level of job quality in that sector, i.e., employees in sectors with higher job quality report higher levels of well-being. However, there are sectors in which the level of well-being does not equate to that which might be expected to occur based on the level of job quality in that sector. For example, the hotels and restaurants and the retail sectors

have lower levels of job quality but have, respectively, average and higher than average levels of employee well-being. Similarly, the health and social work and education sectors have higher levels of job quality but have lower than average levels of employee well-being. It is difficult to know why this occurs. It could be that employees in these sectors are more or less likely to report psychological or physical health problems. It might also result from these sectors having particular job features that combine synergistically to effect well-being in a positive or negative manner.

Although the evidence derived from the extant literature is useful at identifying the relative level of job quality and job outcomes between sectors, it has a number of limitations. One important limitation is that it is difficult to state the absolute quality of a job and therefore to say with certainty that the quality of a job is 'good' or 'bad'. This is because there is no agreement on the level at which a particular job feature becomes particularly problematic or advantageous in terms of its impact on employee outcomes such as psychological well-being. Thus, although there are sectoral differences in the relative level of job quality, it is difficult to assert whether these are differences between sectors with bad and average quality, between sectors with average and good quality jobs, or between sectors with good and very good quality jobs. Moreover, certain aspects of job quality have not been examined with regard to sectoral differences, e.g., performance-related pay, employee participation and involvement in decision-making; and as few studies have sought to examine the total level of job quality, it is difficult to compare readily between sectors.

A further limitation is that it is difficult to assert with confidence whether more and better jobs have been created, i.e., more jobs of a higher quality. One reason for this is that, based on current evidence, it is not known whether job growth was greater in sectors with higher job quality than in sectors with lower job quality. Furthermore, when estimating changes in the general level of job quality it is important to consider changes in job quality resulting from shifts in size of sectors and changes in job quality common to all sectors in the European economy. For example, it could be the case that although there has been a shift to sectors with relatively high levels of job quality, this may not have resulted in an increase in the general level of job quality if there has been a general downward trend in job quality across all sectors. Future research is therefore needed that estimates whether sectoral shifts in employment have led to an increase or decrease in the level of job quality in the EU.

A third limitation is the level of sectoral analysis, with most studies reporting differences at the sector (NACE Level 1) level rather than the sub-sector (NACE Level 2) level. This might mask important differences in job quality and growth between sub-sectors within a sector. For example, at the sector level, results might indicate little growth and average levels of job quality. But this result may occur because the sector is polarised between declining sub-sectors with very high job quality and growing sub-sectors with very low job quality. A lower level of analysis would help identify those sub-sectors that are particularly problematic with regard to job quality and that have shown high levels of employment growth.

3 PART 3: An Empirical Analysis of Job Quality in Growing and Declining Sectors

Part 2 of this report reviewed the current literature on job quality. However, limitations of the current literature are that it does not provide a systematic comparison of growing and declining sectors, and that most studies report differences at the sector level (NACE Level 1) level rather than the sub-sector level (NACE Level 2). A further limitation is that few studies on job quality in Europe have sought to examine the total level of job quality, making it difficult to compare readily between sectors. To address these limitations, the second aim of this report is to provide a detailed empirical assessment on how the level of job quality varies between growing sectors and sub-sectors of the economy in the European Union and Norway using the European Working Conditions Survey data set from 2005. A necessary first step is to develop a measure of job quality and the approach taken in this report is to develop an aggregated measure of job quality, i.e., a single index that summarises the overall level of job quality from the separate features of a job (Leschke & Watt, 2008; Tangian, 2007).

A central issue when creating an aggregated measure of job quality is how to weight the separate job factor measures from which the aggregate measure is formed. Weighting is important because some job factors are likely to have a relatively greater effect on outcomes such as well-being than other job factors. This implies that certain job factors make a greater contribution to job quality than others, and that this relatively greater contribution to job quality should be reflected in aggregated measures of job quality. For example, if job discretion accounts for more of the variance in employee well-being than training, this implies that job discretion makes a greater contribution to job quality than training. As such, job discretion should be weighted more heavily than training in a job quality index. Furthermore, certain job characteristics may make a positive contribution, while others may make a negative contribution. These different effect valences also need to be accounted for in the weighting process. Interestingly, some authors decide not to weight when creating aggregated job indexes, as they believe there is no reliable information or method with which to make decisions on weighting (Tangian, 2007). But a non-weighted index is problematic as it assumes that all indicators contribute positively, equally and independently to job quality. This means that the importance of particular indicators may be over or under represented in an unweighted aggregate measure.

A number of different approaches to weighting are possible. Theoretically-based weighting procedures derive weights from theory. But it is not possible to take this approach because current theories of job quality do not specify the relative importance of different aspects of a job. Subjectively-based weighting procedures derive weights from subjective judgements. For example, Leschke and Watt (2008) weighted indicators of job quality based on their personal evaluation of the importance of each indicator. For example, they weighted wage level as 70/100 and job discretion as 25/100. The lack of theoretical or empirical basis in subjective weighting approaches is likely to lead to weights being specified incorrectly.

Criterion-based weighting procedures derive weights from the nature (e.g., size, direction) of the relationship between an independent variable and a criterion measure. An advantage of this approach is that weights are derived empirically from the data, thereby providing a reasonably objective approach to weight estimation. Furthermore, with regard to job quality measures, if the criterion variable represents a beneficial outcome of the job (e.g., employee well-being, low quit rates), then the average score of the weighted variables (i.e., the aggregated job quality measure) represents the extent to which a job has a combination of factors that are likely to promote beneficial outcomes, and thus the job quality measure will be in keeping with the definition of job quality outlined earlier. One example of the use of a criterion-based approach to developing weights is Jencks, Perman and Rainwater (1988), who asked workers to rate the desirability of their job in relation to an average job (which was scored as 100). The job desirability score was then regressed on workers' assessments of forty-eight job characteristics. From this regression they selected the fourteen job characteristics that were significantly related to job desirability and used the coefficient of each job characteristic to weight its contribution to a job quality index. However, a key disadvantage of basing weights on regression coefficients is that each coefficient may not accurately reflect the unique relationship between an independent variable and criterion due to multicollinearity between the independent variables, which is highly likely when variables are from a similar domain such as job characteristics. The use of job comparative desirability as a criterion is also problematic, as an accurate score depends on the employee having a detailed understanding of a range of other jobs, which may be an assumption that is difficult to justify.

In this report, we take a different criterion-based approach to weighting. First, we weight job factors based on the variance of a criterion that is uniquely explained by a job factor and by the valence of the relationship between job factor and criterion. For example, if job discretion explains five percent of the variance in an beneficial outcome (e.g., employee well-being, low quit rates) and the relationship between them is positive, then job discretion measure would be weighted by .05. One means of estimating the unique variance explained in an outcome by a job factor is to use multiple relative weight analysis (LeBreton & Tonidandel, 2008). This procedure takes into account any multicollinearity between independent variables and provides a means of accurately specifying the unique percentage of variance explained in multiple outcomes by an independent variable. Second, we use three well-being related outcomes (job satisfaction, physical well-being, psychological well-being) as the criterion. Using well-being related outcome as the criterion has the advantage of being readily identifiable as a beneficial outcome of a job and the measurement of such constructs is relatively straightforward. This also means that job quality is weighted in regard to a broad range of well-being outcomes, such that weights will not reflect a narrow conceptualisation of well-being. Thus, we will develop an aggregated weighted index of job quality with the weight of each job factor calculated using multiple relative weight analysis.

We now describe, in the methodology, the procedure for developing the weighted job quality measure and provide an analysis which seeks to establish the reliability and

validity of the weighted job quality measure, by examining whether the weighted job quality measure performs in a manner that might be expected and whether there is any advantage in using the weighted measure over a more standard non-weighted measure. Part 3 ends with the results concerning job quality between growing sectors and sub-sectors in EU countries.

3.1 Methodology

3.1.1 Procedure for Developing the Weighted Job Quality Measure

There were six steps in the procedure to development the weighted job quality measure.

i. Develop measures of the different aspects of job quality The first step of the procedure is to develop measures that reflect the key aspects of job quality. Using the EWCS 2005 we sought to develop measures that reflect key characteristics of job quality across each of its five dimensions of job quality (see Table 1.2). We also sought to develop multi-item measures where possible, using multiple correspondence analysis when items were binary and factor analysis when items were continuous. All items were recoded when necessary, such that high scores represent higher levels of job that characteristic. The complete set of measures that was developed is set out in Table 3.1 and it can be seen that the full set provides a reasonably comprehensive coverage of all five of the main dimensions of job quality. However, as the EWCS 2005 does not cover all characteristics of job quality, some job characteristics could not be included.

ii. Standardize each measure At this point, the measures were a mixture of multi-item measures developed from items with either binary or multiple response scales, single items measured on a binary scale, and single items measured on a multiple response scales. In addition, some multi-item measures displayed non-normal distributions. This meant that not all the measures were on the same scale, and differed in terms of their distribution. As this creates difficulties when aggregating measures we standardized each measure by dichotomising it, when appropriate, around the median score.

iii. Calculate relative weight of each job quality characteristic: The procedure for calculating the relative weight of each job quality characteristic used multiple relative weight analysis (Le Breton & Tonidandel, 2008). Multiple relative weight analysis estimates the unique percentage of variance explained in multiple outcomes by an independent variable. Importantly, multiple relative weight analysis provides a more accurate method of estimating the proportion of variance explained than other methods, such as correlation and regression-based procedures. For example, the variance shared by correlated outcomes (e.g., well-being related outcomes) cannot be unambiguously assigned to a particular variable when partial and semi-partial correlations are used, and standardized regression coefficients are difficult to interpret when there are high levels of multicollinearity, which is likely when examining different job quality characteristics.

Three well-being-based outcome measures were used in relative weight analysis and were selected to represent different aspects of well-being (The items used to construct these three measures can be seen in Table 3.2). They were:

- Physical well-being, the extent to which an employee is free from physical ill-health symptoms, i.e., hearing problems, vision, skin problems, backache, headaches, stomach ache, muscular pains, and respiratory difficulties.
- Psychological well-being, the extent to which an employee is free from psychological problems, i.e., stress, fatigue, sleeping problems, anxiety, and irritability.
- Job satisfaction, the extent to which an employee is satisfied with his or her job.

For each job quality dimension we conducted a multiple relative weight analysis using the three outcome measures and all the job characteristic measures appropriate to that dimension. For example, for work organisation, the multiple relative weight analysis included the three outcome measures and all the job resource characteristic measures (i.e., job discretion, variety, social support, work in a team, team autonomy) and all the job demand characteristic measures (i.e., physical demands, ambient demands, workload, cognitive and emotional demands, interaction demands, interdependency, complexity). The results of the relative weight analysis for each job quality dimension can be seen in Table 3.3. In particular, Table 3.3 shows the weight of each job quality characteristic in relation to each outcome. It also shows the correlation coefficient of the relationship between each measure of job quality and each outcome.

iv. Create aggregate mean score for each job quality dimension The next step created a weighted mean score for each job quality dimension. The first stage of doing this is weight each job characteristic measure. This is done by multiplying each job quality characteristic by the each outcome weight (with the valence of the weight determined by the valence of the correlation between the job characteristic and outcome) to create three new variables. For example, three weighted job discretion variables are created by multiplying job discretion by its weight with physical well-being (.000), by its weight with psychological well-being (.000) and by its weight with job satisfaction (.014). The valence of the weighting in each instance is positive, as the relationship between job discretion and each well-being measure is positive (see Table 3.3).

The second stage created the mean score for each job quality dimension from all relevant weighted job quality characteristic variables. For example, the skills and development dimension mean score was created from the average of nine variables, namely: the training measure, the development measure and skill utilization measure weighted by physical well-being; the training measure, the development measure and skill utilization measure weighted by psychological well-being; and the training measure, the development measure and skill utilization measure weighted by job satisfaction.

Although there are five job quality dimensions, we created seven weighted aggregate mean scores. Thus, in addition to creating mean scores for pay, skills and development and engagement, we also created separate scores for the sub-dimensions of work

organisation (i.e., job demands, job resources) and the sub-dimensions of security and flexibility (i.e., security and flexibility). We did this to aid interpretation of the results.

v. Create weighted total job quality score The weighted total job quality score is then created from average the seven separate job quality dimension scores.

vi. Normalise weighted total job quality score Finally, to aid interpretation, the weighted total job quality score is normalised to a scale of 0 to 100 (such that the score represents the percentage of the absolute maximum). This normalisation process uses the following formula (see also Tangian, 2007):

$$y = \frac{x - x_{\min}}{x_{\max} - x_{\min}} * 100$$

In summary, the normalised weighted total job quality score provides an indication of the extent to which a job has characteristics that promote well-being. A higher score indicates that a job has more of the characteristics that are likely to promote well-being. This is consistent with the definition of job quality provided earlier, namely that job quality is the extent to which a job has features that promote employee well-being. All mean scores were calculated in SPSS and weighted with a response weight representing selection probability, non response and country size. All correlational and regression analyses used this response weight as a control. Analyses were also conducted without this response weight and showed that the use of the weight had no effect on the key findings.

Table 3.1: Job Quality Characteristic Measures

Dimension	Sub-Dimension	Characteristic	Definition	EWCS items
Work organisation	Job resources	Job discretion	Extent to which employee has control over method and timing of work	q24aR, q24bR, q24cR
		Variety	Extent to which employee competes different types of tasks	q26aR, q26a_1R
		Social support		q25aR, q25bR, q25cR
	Job demands	Work in a team	Person works as part of a team	q26bR
		Team autonomy	Team has control over methods of work	q26b_1aR, q26b_1bR
		Physical demands		q11aR, q11cR, q11dR, q11eR
		Ambient demands		q10bR, q10cR, q10dR
		Workload		q20b_aR, q20b_bR, q25fR
		Cognitive and emotional demands		q25iR, q25mR
		Interaction demands	Extent to which job involves interacting with others (but not work colleagues)	q11j
Interdependency		q21aR, q21cR, q21dR, q21eR		
Complexity		q23cR, q23eR, q23fR		
Wage & payment system	Wage	Wage level	Wage level (standardized within country into 10 bands)	ef5
		Fixed salary	Remuneration include a fixed salary	ef6aR
		Performance payments	Pay for productivity	ef6bR
		Compensation pay	Payment for working additional hours, dangerous conditions, Sunday work	ef6cR, ef6dR, ef6eR
Group pay	Pay from group and company performance	ef6gR, ef6hR, ef6iR		

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Dimension	Sub-Dimension	Characteristic	Definition	EWCS items
Security & flexibility	Security	Job security	Perception that might lose job in next 6 months (reverse scored)	q37a
		Part-time/Full-time	Part-time or full-time contract	q15a
		Permanent contract	Permanent contract	q3b
		Fixed contract	Contract of fixed length	q3b
		Agency contract	Agency contract	q3b
		Apprenticeship	Apprenticeship contract	q3b
		No contract	No contract	q3b
	Flexibility	Fixed-time schedules	Working same times each day and week	q16a_aR, q16a_bR, q16a_cR
		Shift work	Shift work	q16a_dR
		Working time set by organisation	Organisation sets working time arrangements	17a response 1
		Choice of working time schedules	Choice of working time arrangements	17a response 2
		Adapt working time	Can adapt working time arrangements	17a response 3
		Night work	Worked in night in last month	q14a
		Evening work	Worked in evening in last month	q14b
Sunday work	Worked on a Sunday in last month	q14c		
Saturday work	Worked on a Saturday in last month	q14d		
10-hour day	Worked 10-hour day in last month	q14e		
Skills & development	Skills & development	Training	Level of training received	q28a_1R, q28cR, q28dR
		Development opportunities	Job offers good career development opportunities and opportunities to learn	q37c, q37e
		Skill utilization	Job duties correspond with skills	q27 response b
Engagement & representation	Engagement	Engagement & consultation	Employee has discussions with boss concerning performance and is consulted on future changes	q30aR, q30bR, q30cR

Note: R means the item was reverse coded.

Table 3.2: Well-Being Outcome Measures

Dimension	Definition	EWCS items
Physical well-being	Extent to which employee does not report that work affects physical ill-health (hearing problems, vision, skin problems, backache, headaches, stomach ache, muscular pains, respiratory difficulties)	q33a_aR, q33a_bR, q33a_cR, q33a_dR, q33a_eR, q33a_fR, q33a_gR, q33a_hR
Psychological well-being	Extent to which employee does not report that work affects psychological problems (stress, overall fatigue, sleeping problems, anxiety, irritability)	q33a_kR, q33a_lR, q33a_mR, q33a_oR, q33a_pR
Job satisfaction	Level of satisfaction with the job	q36R

Note: R means the item was reverse coded.

Table 3.3: Relative Weights and Correlations of Job Quality Characteristic Measures

Dimension	Characteristic	Measure	Well-Being Measure					
			Physical Well-Being		Psychological Well-Being		Job Satisfaction	
			Weight	r	Weight	r	Weight	r
Work organisation	Job resources	Job discretion	.000	.014	.000	.033	.014	.174
		Variety	.003	-.082	.000	-.062	.001	.004
		Social support	.002	.036	.000	.022	.024	.185
		Work in a team	.002	-.067	.000	-.045	.001	-.021
		Team autonomy	.000	-.033	.000	-.026	.002	.052
	Job demands	Physical demands	.006	-.196	.027	-.234	.028	-.264
		Ambient demands	.004	-.177	.015	-.204	.029	-.257
		Workload	.004	-.117	.001	-.102	.002	-.098
		Cognitive and emotional demands	.019	-.078	.007	.023	.005	.115
		Interaction demands	.004	-.019	.004	.040	.002	.077
		Interdependency	.000	-.075	.001	-.073	.012	-.163
		Complexity	.007	-.070	.001	-.014	.005	.105

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			Well-Being Measure					
Dimension	Characteristic	Measure	Physical Well-Being		Psychological Well-Being		Job Satisfaction	
			Weight	r	Weight	r	Weight	r
Wage and payment system	Wage	Wage level	.007	-.037	.004	.019	.018	.132
		Fixed salary	.000	.010	.001	.033	.004	.073
		Performance payments	.001	-.028	.002	-.049	.001	-.013
		Compensation pay	.002	-.067	.003	-.066	.001	-.001
		Group pay	.001	-.027	.001	-.018	.005	.056
Security and flexibility	Security	Job security	.000	-.044	.001	-.043	.060	-.258
		Part-time/Full-time	.002	-.068	.000	-.048	.001	-.040
		Permanent contract	.001	-.025	.000	-.013	.000	.002
		Fixed contract	.001	.027	.000	.013	.001	-.044
		Agency contract	.000	.020	.000	.012	.000	-.010
		Apprenticeship	.000	.012	.000	.007	.000	.017
		No contract	.000	.024	.000	.014	.000	-.018
	Flexibility	Fixed-time schedules	.001	.062	.000	.034	.001	.020
		Shift-work	.000	-.062	.000	-.050	.006	-.116
		Working time set by organisation	.000	-.010	.001	-.033	.010	-.119
		Choice of working time schedules	.000	.012	.000	.012	.001	.005
		Adapt working time	.000	.017	.001	.036	.002	.075
		Night work	.003	-.096	.000	-.058	.001	-.073
		Evening work	.004	-.104	.000	-.055	.001	-.061
		Sunday work	.005	-.112	.000	-.064	.001	-.074
		Saturday work	.001	-.095	.001	-.075	.004	-.097
		10-hour day	.009	-.127	.000	-.072	.001	-.053
Skills and development	Skills and development	Training	.007	-.040	.002	.012	.005	.091
		Development opportunities	.001	.091	.008	.111	.144	.389
		Skill utilization	.002	.030	.000	.001	.002	.033
Engagement and representation	Engagement	Engagement and consultation	.006	-.035	.002	.012	.004	.072

Note: Weight represents the unique percentage of variance explained; r is the correlation coefficient.

3.1.2 Establishing the Performance of the Weighted Job Quality Measure

To establish whether the weighted job quality measure was performing in a manner that might be expected, we examined differences in job quality by occupational level, educational level, country, and economic sector (i.e., NACE Level 2). In addition, to establish whether there is any advantage to using the weighted measure over more standard approaches to measuring job quality, we compared the performance of the weighted job quality measure to an unweighted aggregate job quality measure, i.e., an average of all the standardized job characteristic measures. The full procedures for creating these variables are summarised in Table 3.4.

Table 3.4: Summary of Procedures for Developing Job Quality Measures

Step	Weighted Job Quality	Unweighted Job Quality
Choose job quality dimensions	✓	✓
Develop measures of job quality characteristics	✓	✓
Standardize score of each measure	✓	✓
Calculate relative weight for each job characteristic	✓	✗
Create aggregate mean score for each job quality dimension	✓	✓
Create total mean score for job quality	✓	✓
Normalise scores (0 to 100)	✓	✓

Focusing first on the weighted job quality measure, the results show that its level increases with occupational level (See Table 3.5) and with educational level (See Table 3.6). Such patterns are to be expected based on previous research evidence. With regard to country differences, the results in Table 3.7 show that job quality is high in Scandinavian countries, as well as in countries such as the Netherlands, UK, Ireland, Luxembourg, Austria, Belgium and France. It is lower in the New EU Member States and some Southern European countries, a pattern that would be expected based on previous research. Differences in job quality between sectors are shown in Table 3.9. Again, the pattern of differences is that which is to be expected based on previous research, e.g., job quality is higher in Financial Intermediation and Real Estate, and lower in Agriculture and Fishing, and Hotels and Restaurants (Tangian, 2007).

Table 3.5: Differences in Job Quality by Occupational Level (ISCO First-Level)

Occupation: First-level ISCO Codes	Weighted Job Quality	Unweighted Job Quality
ISCO 1 - Legislators, senior officials and managers	59.50	57.12
ISCO 2 - Professionals	63.73	55.46
ISCO 3 - Technicians and associate professionals	61.35	53.48
ISCO 4 - Clerks	59.37	47.89
ISCO 5 - Service workers and shop and market sales workers	53.47	49.21
ISCO 6 - Skilled agricultural and fishery workers	39.36	51.94
ISCO 7 - Craft and related trades workers	49.34	50.88
ISCO 8 - Plant and machine operators and assemblers	44.49	47.82
ISCO 9 - Elementary occupations	45.69	42.61
ISCO 0 - Armed forces	62.26	60.87
<i>Total</i>	<i>54.83</i>	<i>50.79</i>

Comparing the weighted and unweighted job quality measures shows that they perform similarly with regard to occupational and educational level, i.e., both increase with higher occupational and educational levels. However, the unweighted job quality measure does not produce the expected pattern of country differences. For example, scores of the unweighted job quality measure for the New Member States of Slovenia and Estonia are higher than for countries such as UK, Belgium and Austria (See Table 3.8). These results therefore provide a high level of confidence that the weighted job quality measure will be able to produce valid and reliable differences in job quality with regard to sector and sub-sector differences (NACE Level 1 and 2).

Table 3.6: Differences in Job Quality by Educational Level

ISCED classification: The Highest Level of Education or Training	Weighted Job Quality	Unweighted Job Quality
No education	44.97	41.48
Primary education (ISCED 1)	45.60	44.06
Lower secondary education (ISCED 2)	49.17	47.77
Upper secondary education (ISCED 3)	52.70	49.70
Post-secondary including pre-vocational or vocational education (ISCED 4)	58.94	54.47
Tertiary education - first level (ISCED 5)	62.91	55.18
Tertiary education - advanced level (ISCED 6)	65.77	56.71
<i>Total</i>	<i>54.88</i>	<i>50.84</i>

Table 3.7: Differences in Job Quality by Country: Ranked by Weighted Job Quality

Country	Weighted Job Quality	Unweighted Job Quality
Denmark	62.70	56.03
Netherlands	61.31	56.92
Norway	61.27	57.40
United Kingdom	59.49	53.33
Sweden	59.26	58.93
Ireland	58.93	53.72
Luxembourg	58.76	52.06
Belgium	57.80	53.42
France	55.42	48.46
Austria	55.12	54.12
Cyprus	54.80	49.27
Germany	54.20	49.90
Spain	53.56	48.57
Latvia	53.17	54.02
Portugal	52.52	46.51
Lithuania	52.11	53.89
Estonia	52.02	55.37
Italy	51.80	46.66
Slovenia	50.72	56.71
Slovakia	50.64	53.27
Hungary	50.13	48.00
Czech Republic	49.80	52.90
Greece	49.79	52.04
Poland	48.76	49.10
<i>Total</i>	<i>54.83</i>	<i>50.82</i>

Table 3.8: Differences in Job Quality by Country: Ranked by Unweighted Job Quality

Country	Weighted Job Quality	Unweighted Job Quality
Finland	63.65	65.26
Sweden	59.26	58.93
Norway	61.27	57.40
Netherlands	61.31	56.92
Slovenia	50.72	56.71
Denmark	62.70	56.03
Estonia	52.02	55.37
Austria	55.12	54.12
Latvia	53.17	54.02
Lithuania	52.11	53.89
Ireland	58.93	53.72
Belgium	57.80	53.42
United Kingdom	59.49	53.33
Slovakia	50.64	53.27
Czech Republic	49.80	52.90
Luxembourg	58.76	52.06
Greece	49.79	52.04
Germany	54.20	49.90
Cyprus	54.80	49.27
Poland	48.76	49.10
Spain	53.56	48.57
France	55.42	48.46
Hungary	50.13	48.00
Italy	51.80	46.66
Portugal	52.52	46.51
<i>Total</i>	<i>54.83</i>	<i>50.82</i>

3.2 Results

3.2.1 Total Job Quality in Growing and Declining Sectors

The total job quality scores for each sector are shown in Table 3.9. From this it is evident that there are four groups of sectors, which can be distinguished by job quality and growth. Growing sectors of the economy with higher than average job quality include Business, Health and Social Work, Education, Public Administration and Financial Intermediation. Growing sectors of the economy with lower than average job quality include Construction, Retail, Other Services and Hotels and Restaurants. The declining sector of the economy with higher than average job quality is the Energy sector, and the declining sectors with lower than average job quality include Mining, Transport, Manufacturing and Agriculture.

Table 3.9: Differences in Job Quality by Sector (NACE Level 1)

	Sector Growth	Weighted Job Quality	Unweighted Job Quality
Growing High Quality Sectors			
Business	3.40	60.22	47.35
Health & social work	1.21	59.01	52.57
Education	.47	61.68	47.07
Public administration	.19	62.27	50.61
Financial intermediation	.03	67.68	50.69
Declining High Quality Sectors			
Energy/Utilities	-.24	60.59	52.55
Growing Low Quality Sectors			
Construction	2.33	52.09	49.60
Retail	.62	53.50	44.77
Other services	.55	54.65	45.24
Private households	.47	41.89	29.58
Hotels and restaurants	.38	48.83	47.70
Declining Low Quality			
Mining	-.24	43.91	45.72
Transport and communication	-.34	52.91	48.64
Manufacture	-3.04	50.86	46.89
Agriculture and fishing	-3.62	41.24	46.86
<i>Total</i>		<i>54.87</i>	<i>47.63</i>

Table 3.10: Job Quality Dimensions by Sector

Sector	Job Quality	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
Growing High Quality Sectors								
Business	60.22	58.80	57.61	72.24	29.94	64.04	48.09	45.48
Health & social work	59.01	54.65	55.93	69.79	29.66	56.36	50.55	53.28
Education	61.68	57.30	57.14	70.15	31.48	64.37	55.05	49.54
Public administration	62.27	57.03	57.48	72.14	30.90	62.44	55.16	53.61
Financial intermediation	67.68	61.51	58.86	85.65	31.27	70.16	50.41	60.23
Declining High Quality Sectors								
Energy/Utilities	60.59	51.93	57.68	76.44	31.51	61.66	50.26	50.13
Growing Low Quality Sectors								
Construction	52.09	45.50	55.29	63.50	30.36	62.69	45.84	42.23
Retail	53.50	53.49	54.87	59.54	28.94	60.82	46.39	43.59
Other services	54.65	54.25	54.87	62.30	29.20	61.72	48.96	39.37
Private households	41.89	52.22	47.04	27.64	26.97	73.82	49.41	25.32
Hotels and restaurants	48.83	47.81	53.01	54.01	28.81	48.89	44.91	41.05
Declining Low Quality								
Mining	43.91	46.78	50.01	41.20	28.59	53.92	45.55	26.37
Transport and communication	52.91	52.65	53.63	54.87	30.78	54.51	46.91	48.51
Manufacture	50.86	49.09	53.08	54.93	29.89	60.30	44.91	39.67
Agriculture and fishing	41.24	44.96	55.18	36.83	27.83	54.97	51.59	35.23
<i>Total</i>	54.87	52.68	55.18	62.05	29.88	60.50	48.37	45.20

Table 3.10 displays the job quality scores for each dimension of job quality. Because of the normalising process the scores between different dimensions cannot be compared but sector scores within each dimension can be compared. This table reveals that the growing high quality sectors tended to have higher than average scores across all of the job quality dimensions. However, it is not necessarily the case that all the growing low quality sectors score below average across all the job dimensions. For example, the Other Services and Retail sectors have above average scores for job demands, while Construction and Other Services score above average on skills and development. Interestingly, with the exception of Hotels and Restaurants, all growing low quality sectors have an average or slightly higher than average scores with regard to job flexibility.

It can also be noted from Table 3.9 that the unweighted job quality measure also appears to overrate the quality of jobs in sectors such as Construction and Hotels and Restaurants and underrate the quality of jobs in the Business and Education sectors, which provides further evidence that the weighted job quality measure produces a more reliable and differentiated pattern of group differences across wider range of criteria than the unweighted job quality measure.

A more detailed analysis of the job quality of growing and declining sub-sectors is shown in Appendix B. The sub-sectors with the highest growth but lowest quality are summarised below and it is noticeable that the sub-sectors with the highest growth but lowest levels of job quality mainly in the service sector, e.g., Construction, Hotels and Restaurants, although there are also number of growing manufacturing sectors that also have lower than average job quality.

The sub-sectors with the highest growth and highest levels of job quality are also mainly in the service sector, e.g., Other Business Activities, Health & Social Work. However, there are no growing manufacturing sectors that also have a higher than average job quality. This might indicate that high quality manufacturing jobs are not being created in the EU.

NACE No.	Sub-Sector	Growth	Weighted Job Quality
45	Construction	0.0246	52.09
95	Activities of households as employers of domestic staff	0.0036	41.89
55	Hotels and restaurants	0.0035	48.83
63	Supporting and auxiliary transport activities	0.0032	53.19
28	Manufacture of fabricated metal products, except machinery	0.0020	48.57
34	Manufacture of motor vehicles, trailers and semi-trailers	0.0017	51.89
93	Other service activities	0.0013	53.30
33	Manufacture of medical, precision and optical instruments	0.0007	52.76
50	Sale, maintenance and repair of motor vehicles and motorcycles	0.0007	54.19
90	Sewage and refuse disposal, sanitation and similar activities	0.0007	49.25

3.2.2 Vulnerable Workers

Vulnerable workers can be defined as those employees at risk of working in low quality jobs and they are typically seen to include women, young and old workers, and those employees working in jobs with part-time or temporary contracts. In this section, we examine whether vulnerable workers are more prevalent in growing or declining sectors of the economy.

Gender

The proportion of men and women in growing and declining sectors is shown in Table 3.11, which indicates that women are less prevalent in three of the high quality growing sectors (Business, Public Administration and Financial Intermediation), are more prevalent in two of the high quality growing sectors (Education, and Health and Social Work) and are more prevalent in almost all of the low quality growing sectors. Moreover, within the high quality growing sectors (exception Education), men typically have jobs of a higher quality than women, whereas in the low quality sector such differences are less pronounced. In short this suggests that women are much less likely to get jobs in the high quality growing sectors, and when they do get a job in these sectors, it is more likely to be of a lower quality.

Table 3.11: Gender Differences in Job Quality by Sector (NACE Level 1)

	Male %	Male Job Quality	Female %	Female Job Quality
Growing High Quality Sectors				
Business	56.6	61.23	43.4	58.91
Health & social work	21.6	59.41	78.4	58.89
Education	28.1	63.04	71.9	61.15
Public administration	58.7	61.66	41.3	63.14
Financial intermediation	55.7	69.34	44.3	65.61
Declining High Quality Sectors				
Energy/Utilities	80.5	60.48	19.5	61.06
Growing Low Quality Sectors				
Construction	89.7	50.71	10.3	64.08
Retail	45.6	55.07	55.4	52.18
Other services	40.9	54.25	59.1	54.93
Private households	14.9	41.69	85.1	41.92
Hotels and restaurants	51.8	50.10	48.2	47.47
Declining Low Quality				
Mining	92.5	42.63	7.5	60.48
Transport and communication	73.5	51.39	26.5	57.09
Manufacture	69.8	51.48	30.2	49.42
Agriculture and fishing	66.0	41.76	34.0	40.24
<i>Total</i>	<i>55.8</i>	<i>54.36</i>	<i>44.2</i>	<i>55.53</i>

Age

Table 3.12 shows that the proportion of younger workers (15-29) is higher in low quality growing sectors of the economy than in high quality growing sectors, and that middle age (30-49) and older workers (50+) are more prevalent in high quality growing sectors. This may suggest that, while low quality growing sectors enable younger workers to gain access the labour market, young workers find it more difficult to gain access to jobs in high quality growing sectors. There are also some gender differences. In high quality growing sectors, the proportion of young and middle age women is slightly higher than the proportion of young and middle age men; while the proportion of older women in these sectors is much lower than the proportion of men in these sectors. One interpretation of this is that younger and middle age women experience fewer barriers than older women in entering high quality growing sectors, which might be a result of equal opportunity policies and practices. Another interpretation is that women find progress in these high quality growing sectors to be more difficult than men or find it hard to re-enter these sectors when returning from career breaks. Indeed, the greater proportion of middle age women than men in low quality growing sectors might suggest that middle age women are re-entering the workforce after career breaks in these low quality sectors.

Full-Time/Part-Time An analysis of the proportion of jobs that are full-time or part time (Table 3.13) reveals that part-time jobs are more prevalent in growing sectors than in declining sectors. Within the growing sectors, part-time work is generally more prevalent in the low quality sectors than in the high quality sectors, the only exception to this being the Construction industry that has a very low proportion of part-time jobs (4.4%). There is also a clear gender difference, with a greater proportion of women having part-time jobs than men and a greater proportion of women in low quality growing sectors having part-time jobs.

Permanent contract The results in Table 3.14 indicate that permanent contracts are slightly more prevalent in the high quality growing sectors than in the low quality growing sectors, where non-permanent contracts (e.g., fixed term contract, temporary agency contract or no contract) are slightly more prevalent. There is no clear pattern of gender difference with regard to contract type in the high quality growing sectors. For example, a slightly higher proportion of women in the Public Administration and Health and Social Work sectors have permanent contract, whereas the reverse is the case in the Business, Education and Financial Intermediation sectors. However, however, there is a much more distinct gender difference in the low quality growing sectors, in which a lower proportion of women have permanent contracts (the only exception being construction).

Table 3.12: Differences by Sector and Age of Men and Women

	All			Men			Women		
	15-29 %	30-49 %	50+ %	15-29 %	30-49 %	50+ %	15-29 %	30-49 %	50+ %
Growing High Quality Sectors									
Business	25.9	53.5	20.6	23.2	54.1	22.8	29.4	52.7	17.9
Health & social work	16.6	58.1	25.3	11.5	56.4	32.1	18.0	58.5	23.5
Education	15.4	58.9	25.7	13.6	56.2	30.3	16.1	59.9	24.0
Public administration	17.2	56.8	26.0	17.6	56.1	26.2	16.5	57.8	25.7
Financial intermediation	17.7	60.0	22.4	17.4	59.8	22.7	18.2	59.9	21.8
Declining High Quality Sectors									
Energy/Utilities	24.3	50.6	25.1	27.8	47.8	24.5	11.1	61.7	27.2
Growing Low Quality Sectors									
Construction	23.4	55.5	21.2	23.8	54.7	21.5	19.4	62.3	18.3
Retail	28.6	50.6	20.9	30.0	50.8	19.2	27.3	50.4	22.3
Other services	22.6	51.1	26.3	21.1	49.9	28.9	23.6	52.0	24.4
Private households	9.8	43.8	46.4	0.0	11.8	88.2	11.6	49.5	38.9
Hotels and restaurants	41.9	43.2	14.9	40.5	41.9	17.6	43.3	44.4	12.3
Declining Low Quality									
Mining	7.5	65.3	27.2	5.9	65.4	28.7	30.0	70.0	0.0
Transport and communication	18.6	57.3	24.2	16.8	57.5	25.7	23.4	56.7	19.9
Manufacture	21.4	55.1	23.5	20.8	54.4	24.7	22.8	56.5	20.7
Agriculture and fishing	15.6	50.7	33.7	16.1	48.7	35.2	14.7	54.4	30.9
<i>Total</i>	22.2	54.2	23.6	21.9	53.5	24.6	22.6	54.9	22.4

Table 3.13: Differences in Full-Time or Part-Time Contract by Sector and Gender

	All		Men		Women	
	Part-Time %	Full-Time %	Part-Time %	Full-Time %	Part-Time %	Full-Time %
Growing High Quality Sectors						
Business	19.7	80.3	8.2	91.8	34.5	65.5
Health & social work	29.6	70.4	14.8	85.2	33.7	66.3
Education	24.1	75.9	8.6	91.4	30.1	69.9
Public administration	12.1	87.9	4.8	95.2	22.4	77.6
Financial intermediation	14.1	85.9	4.6	95.4	26.1	73.9
Declining High Quality Sectors						
Energy/Utilities	3.4	96.6	1.2	98.8	12.5	87.5
Growing Low Quality Sectors						
Construction	4.4	95.6	3.0	97.0	16.1	83.9
Retail	23.4	76.6	10.3	89.7	34.4	65.6
Other services	29.9	70.1	18.7	81.3	37.7	62.3
Private households	42.9	57.1	20.0	80.0	46.4	53.6
Hotels and restaurants	27.6	72.4	15.1	84.9	41.4	58.6
Declining Low Quality Sectors						
Mining	3.4	96.6	1.5	98.5	30.0	70.0
Transport and communication	11.3	88.7	6.7	93.3	24.0	76.0
Manufacture	7.1	92.9	2.6	97.4	17.5	82.5
Agriculture and fishing	12.4	87.6	8.8	91.2	19.4	80.6
<i>Total</i>	<i>17.1</i>	<i>82.9</i>	<i>6.9</i>	<i>93.1</i>	<i>29.9</i>	<i>70.1</i>

Table 3.14: Differences in Permanent Contract by Sector and Gender

	All %	Men %	Women %
Growing High Quality Sectors			
Business	76.5	77.7	75.0
Health & social work	77.7	73.4	78.7
Education	77.1	81.1	75.6
Public administration	84.6	82.9	86.9
Financial intermediation	87.8	93.7	81.8
Declining High Quality Sectors			
Energy/Utilities	79.7	78.0	86.5
Growing Low Quality Sectors			
Construction	73.1	71.5	84.9
Retail	75.8	77.6	74.4
Other services	74.5	75.5	73.9
Private households	36.9	40.0	36.7
Hotels and restaurants	52.9	57.6	48.4
Declining Low Quality Sectors			
Mining	87.1	89.5	60.0
Transport and communication	83.0	84.2	79.8
Manufacture	82.5	84.5	77.9
Agriculture and fishing	55.0	57.0	51.3
<i>Total</i>	<i>74.4</i>	<i>79.3</i>	<i>75.2</i>

3.3 Summary

In Part 3 of the report we developed a weighted job quality measure and demonstrated that it provides a more valid representation of job quality than an unweighted measure. The weighted measure was then used to identify the mean job quality of growing and declining economic sectors in the EU. In particular, it was established that there were four main groups of economic sector which can be distinguished by job quality and growth. They were:

- Growing sectors of the economy with higher than average job quality;
- Growing sectors of the economy with lower than average job quality;
- A declining sector of the economy with higher than average job quality;
- Declining sectors of the economy with lower than average job quality.

The growing sectors were largely located within the service sector and the declining sectors were non-service sectors, e.g., manufacturing, agriculture. At the sub-sector level

(NACE Level 2), high quality growing sub-sectors only included those from the service sector, whereas low quality growing sub-sectors included service and manufacturing sub-sectors. This suggests that high and low quality service jobs have been created, and that growth in the manufacturing sector has occurred mainly in low quality sub-sectors and that high quality manufacturing jobs have not been created extensively in the EU.

Women were also more prevalent almost all the low quality growing sectors, were less likely to have jobs in high quality growing sectors and, when they did, the jobs they held were likely to be of a lower quality than the jobs held by men. A further finding from this study is that women may find it harder than men to progress or re-enter high quality growing sectors and that middle age women may be more likely than men to join low quality growing sectors. Women were also much more likely to have a part-time contract or a non-permanent contract (e.g., fixed term contract, temporary agency contract or no contract) and this is partly a consequence of the fact that women have jobs in low quality sectors where such contracts are more common. Overall, women would appear to have a greater risk of experiencing low quality work, of moving into a job in low quality growing sectors at the beginning of their career and also later on in their career, and of having a part-time or non-permanent contract. This means that the expansion of the EU economy may have an unequal impact on women in comparison to men, not only economically, as low quality jobs tend to have lower pay, but also in terms of women's psychological and physical well-being at work, as low quality jobs are typically associated with lower well-being.

4 PART 4: Job Types in Growing Sectors of the EU Economy

Different types of job are likely to occur across the European economy (Valeyre, et al., 2009). For example, one type of job might combine high job demands and high job discretion with low working time flexibility, whereas another type of job might combine high job demands with low job discretion and high working time flexibility; and these differences between job types suggest that some job types will be of a high quality and some job types will be of a low quality. But the distribution of high and low quality job types across the European economy is unlikely to be equal, as high quality job types may be more prevalent in some economic sectors than others. One implication of the variation in the distribution of job types between sectors is that sectoral growth and decline will change the landscape of job quality in Europe by altering the proportion of high and low quality job types. To gain a nuanced understanding of job quality in Europe and how changes in sector size might affect job quality, it is therefore important to know what types of job exist, the quality of these job types and how job types are distributed among growing and declining sectors of the European economy. The main aims of Part 4 are therefore to develop a taxonomy of job types in the European Union and Norway and to examine the distribution of job types in growing sectors of the European economy.

4.1 Recent Literature on Job Types in the EU

A number of theories propose that different types of jobs will occur in response to organisational, market and institutional conditions. These include strategic human resource management theory (Schuler & Jackson, 1995; Wright & McMahon, 1992) that focuses on organisational strategies and markets, and production regime theory and employment regime theory (Gallie, 2007; Hall & Soskice, 2001), which focus on institutional influences on organisations. These theories typically distinguish between two broad types of job. For example, strategic human resource management theories distinguish between low-commitment jobs and high-commitment jobs. Low-commitment jobs are characterised by Taylorist work organisation (low task discretion, little task variety, low skill requirements), low rates of pay, low levels of training, lower job security (e.g., temporary contracts) and low working time flexibility. High-commitment jobs are characterised by an empowered work organisation with high discretion, variety and skill requirements, allied to higher pay, greater levels of training, working time flexibility and job security. Given these differences between the two job types, low-commitment jobs can be understood as having a lower level of job quality than high-commitment jobs as they are less likely to produce beneficial outcomes for employees. Other types of job have been identified but it can be suggested that these are variants of these two basic job types. For example, some lean manufacturing or lean service jobs can be understood as a variant of the low-commitment job type, as such jobs combine the factors associated with low-commitment jobs with high-levels of team work, such as participation in off-line improvement teams (Delbridge, 2005).

Few studies have examined the nature of job types in the EU, although studies within organisations and across multiple organisations have identified the existence of low-

commitment and high-commitment jobs (Batt, 2002; MacDuffie, 1995; Walton 1985). A notable exception is the study by Valeyre et al. (2009), who sought to identify jobs with different types of work organisation by performing a cluster analysis on a range of items from the EWCS 2005 data set that reflected various aspects of work organisation, namely, job discretion, task complexity, task monotony, constraints on the pace of work teamwork, task rotation, quality control, problem-solving activity and whether individuals learn things at work. Four clusters emerged from the analysis, which they labelled as discretionary learning, lean production, Taylorist and simple. The levels of work organisation in each cluster were:

- **Discretionary learning**
 - Higher levels of job discretion, learning and problem solving opportunities, task complexity, self assessment of quality of work
 - Moderate level of autonomous teamwork.
 - Lower levels of job monotony and work pace constraints.
- **Lean production**
 - Higher levels of teamwork, task rotation, self-assessment of quality of work and quality norms, demand-driven constraints on work pace, learning and problem solving opportunities.
 - Autonomy only just above the mean level.
- **Taylorist**
 - Lower levels of job discretion, learning and problem solving opportunities, task complexity, assistance from colleagues.
 - Moderate levels of team work but with little control over task division.
 - Higher constraints on the pace of work, repetitiveness and quality norms.
- **Simple**
 - Lower levels on all variables.

Further analyses revealed that discretionary learning and lean production types of work organisation were more likely to be combined with higher levels of training, permanent contracts and flexible working hours than Taylorist and simple types of work organisation. But there were also some similarities between lean production and Taylorist jobs, which tended to have higher levels of performance-related pay and non-standard working hours. Overall, the results of the study by Valeyre et al., (2009) suggest that jobs with a discretionary learning type of work organisation have the highest level of job quality, as they not only have high levels of job resources (i.e., the factors of a job that promote well-being and personal growth and accomplishment such as job discretion, learning and problem solving job characteristics, autonomous team work) but they combine high job resources with other high-commitment work and human resource practices. Jobs with a lean production type of work organisation appear to have moderate levels of job quality as they combine a mixture of high job resources (e.g., team work, task rotation), low job resources (e.g., constraints on the pace of work) and high job demands (e.g., learning demands) with some high-commitment work and human resource practices. Taylorist and

Simple job types have the lowest levels of work organisation quality, as both tend to combine low levels of job resource with low-commitment work and human resource practices.

The study by Valeyre et al. (2009) is important as it provides empirical evidence to support the idea that there are different types of job in the EU. But their taxonomy of jobs was based only on an analysis of work organisation. The job types described by Valeyre et al. were therefore not based on all the five main dimensions of job quality, although Valeyre et al. did examine how types of work organisation differed with regard to the other dimensions of job quality. If all the main dimensions of job quality were to be included in an analysis of job types, then a different taxonomy of job types might emerge. A further limitation of the study by Valeyre et al. is that it did not include data from the agricultural or public sectors or from organisations of less than ten employees, nor does it provide an in-depth analysis of job types by job sectors. To address these limitations, we will create a taxonomy of job types using variables relating to all the main dimensions of job quality, and we conduct the analysis using data from all sectors and across all sizes of organisation.

4.2 Methodology

There were four main stages to the methodology. The first stage used two step cluster analysis to establish a taxonomy of job types. The second stage examined the mean level of total job quality and employee well-being for each job type. This was conducted to aid interpretation of the job types and to help validate the taxonomy of job types by showing that meaningful differences exist between them. The third stage examined the distribution of job types amongst occupational groups (ISCO Level 1), employee demographics (e.g., educational level, age, gender) and countries. This analysis will help to validate the taxonomy of job types by showing that job types are distributed in expected ways. The fourth stage examined the distribution of job types amongst economic sector, and specifically, growing economic sectors.

4.2.1 Stage 1: Developing a Taxonomy of Job Types

Procedure The aim of stage 1 was to develop a taxonomy of job types. This was achieved using two-step cluster analysis, a procedure that has a number of advantages over other methods of cluster analysis, as it can include categorical and continuous variables and be used with very large data sets. Another advantage is that the two-step cluster analysis procedure suggests an optimal solution, i.e., the optimal number of clusters. In the first step of the two-step cluster analysis, each case is assigned to an existing precluster or a new precluster based on a log-likelihood distance measure, in the second step these preclusters are grouped using agglomerative hierarchical clustering to produce a range of solutions. The optimal solution is automatically selected based on a combination of the Bayesian Inference Criterion (BIC) for each solution and the solution that has the greatest change in distance between the two closest clusters in the hierarchical clustering stage.

Sample The two step cluster analysis was conducted on a sample of the EWCS 2005 that included all industrial sectors (NACE Level 2) in the EU-27 countries and Norway. The two step procedure cannot handle missing data and so the sample size was 16778.

Measures The measures used in the two step analysis procedure were categorical and continuous measures that reflected key aspects of the five dimensions of job quality. The complete set of the thirty-eight measures is set out in Table 3.1 and it can be seen that they provide a reasonably comprehensive coverage of the five main dimensions of job quality. We sought to develop multi-item measures where possible, using multiple correspondence analysis when items were binary and factor analysis when items were continuous. All items were recoded when necessary, such that high scores represent higher levels of job that characteristic.

4.2.2 Stage 2: Job Types, Job Quality and Employee Well-Being

Procedure and Sample: The aim of the second stage was to establish, for each job type, the mean level of total job quality and the mean level of employee well-being. The sample was the same as at Stage 1 (N= 16778).

Measures: The measure of total job quality is that which is described in Part 3 of this report and it has a scale of 0-100 and high scores indicate higher job quality. In addition, three measures of employee well-being were used. Physical well-being is concerned with the extent to which an employee is free from physical ill-health symptoms, i.e., hearing problems, vision, skin problems, backache, headaches, stomach ache, muscular pains, and respiratory difficulties. It has a scale of 1-2 and the EWCS items for this and the other well-being measures are shown in Table 3.2). Psychological well-being is concerned with the extent to which an employee is free from psychological problems, i.e., stress, fatigue, sleeping problems, anxiety, and irritability. It has a scale of 1-2. Job satisfaction is concerned with the extent to which an employee is satisfied with his or her job. It is based on one item and has a scale of 1-4.

4.2.3 Stage 3: Distribution of Job Types

Procedure: The aim of the third stage of the analysis was to examine the distribution of job types amongst occupational groups, demographic group, economic sector, and growing economic sectors. When appropriate, analyses were weighted by sex, age, region (NUTS-2), occupation (ISCO at 1 digit) and sector (NACE at 1 digit) and country size.

Sample: All analyses were conducted on a sample of all countries in the EU-27 plus Norway but excluding Malta, Romania and Bulgaria. This sample is used to ensure comparability with the analyses of other studies within the WALQING project (N=14106).

Measures: The measures used were occupational groups (ISCO Level 1), educational level (ISCED), age (Categorical age variable), gender, and country.

4.2.4 Stage 4: Distribution of Job Types by Economic Sector

Procedure: The aim of the fourth stage of the analysis was to examine the distribution of job types economic sector, and growing economic sectors. When appropriate, analyses were weighted by sex, age, region (NUTS-2), occupation (ISCO at 1 digit) and sector (NACE at 1 digit) and country size.

Sample: All analyses were conducted on a sample of all countries in the EU-27 plus Norway but excluding Malta, Romania and Bulgaria. This sample is used to ensure comparability with the analyses of other studies within the WALQING project (N=14106).

Measures: The measures used were economic sector (NACE Levels 2 and 3). We also examined the distribution of job types in growing economic sectors and the estimates of job growth in each sector are drawn from Vandekerckhove & Ramioul (2010).

4.3 Job Types in the EU

The auto-clustering algorithm used by the two-step cluster analysis indicated that a six cluster solution was the best model, as it both minimized the BIC value and the change in them between adjacent numbers of clusters. The resulting six clusters contained 2723 (16.2%), 3311 (19.7%), 3051 (18.2%), 3070 (18.3%), 2084 (12.4) and 2539 (15.1%) cases. Tables 4.1a to 4.1e set out the differences in the different aspects of job quality between the six clusters. Based on an analysis of these differences, we labelled each cluster as:

- Active jobs, e.g., research scientist
- Saturated jobs, e.g., senior manager,
- Team-based jobs, e.g., software engineer
- Passive-independent jobs, e.g., night security guard, receptionist
- High-strain jobs, e.g., manufacturing line operator
- Insecure jobs, e.g., temporary office worker.

4.3.1 Active Jobs

In this cluster of jobs, work organisation is characterised by high levels of job resource such as job discretion ($M = 1.83$) and social support ($M = 3.61$). For example, 83% of employees in this cluster reported that they had control over work methods, and 74.5% reported that they received assistance from colleagues. Jobs in this cluster are also characterised by a high level of job demands such as job complexity ($M = 1.81$) and intellectual demands (part of cognitive demand), with 62.3% of jobs having a high level of intellectual demand. Other job demands in this cluster typically occur at a low level - and at a lower level than average - and include workload ($M = 3.51$), physical demands ($M = 2.62$), ambient demands ($M = 1.60$), and timing interdependency ($M = 1.30$). For example, only 36.3% of employees in this cluster reported that they worked at high speed more than half the time.

The combination of high job resources and high job demands such as job complexity and intellectual demand bears a strong resemblance to the 'active jobs' of the job demands-control theory (Karasek & Theorell, 1990). According to this theory, active jobs provide resources (particularly high job discretion) that enable employees to cope better with demands. Active jobs also involve dealing with complex and intellectually demanding tasks that promote intrinsic task interest and motivation as well as the development of skills and knowledge. As a result, employees in active jobs are able to perform effectively and have higher levels of well-being. There is strong empirical evidence to show that employees in active jobs have relatively higher levels of engagement, enthusiasm and well-being than employees in non-active jobs (Bakker, Van Veldhoven & Xanthopoulou, 2010). Given the similarity of work organisation in this cluster to the work organisation of active jobs, we labelled this cluster as the 'active jobs' cluster.

With regard to the skills and development dimension of job quality, although 66.8% of employees in active jobs agree that they have opportunities to learn and grow, the overall level of development opportunities is moderate ($M = 3.33$) but at a higher level than average ($M = 3.00$). Training occurs at a moderate to high level ($M = 1.33$), with 58.6% of employees in active jobs participating in some form of work-based training in the last year compared to an average of 47.5%. Active jobs also typically have a moderate to high level of pay ($M = 6.41$), which is higher than average ($M = 5.69$). Additional income from other sources (i.e., group performance, compensatory pay piece rate work) is not a feature of the majority of active jobs.

Active jobs are further characterised by high levels of security, high working time flexibility and low non-standard working hours (e.g., weekend work, long hours). In particular, the majority of employees in active jobs perceive a high level of job security, with 83.3% not agreeing that they will lose their job in the next six months, and all most all active jobs (97.8%) have permanent contracts. With regard to working time flexibility, all employees in active jobs have some choice over working time, with 63.9% being able to adapt their working time within set limits, and 38.3% being able to use this to achieve very fixed working hours (i.e., having fixed hours each day, fixed hours each week, plus fixed start and finish times). Working time flexibility in most active jobs therefore appears to be organised, in part, to meet the demands of the employee and not solely to meet organisational demands (Chung et al., 2007). With regard to working non-standard working hours, employees in active jobs typically do not work shifts (3%), work at night (0.5%) or at weekends (e.g., 17.2% work on a Saturday), although 28% report having worked a ten-hours day in the last month.

4.3.2 Saturated Jobs

In this cluster of jobs, the level of many job factors was high or higher than average. As such, the jobs in this cluster can be described as 'saturated' with higher levels of job factors across all the main dimensions of job quality. For this reason, we labelled this cluster as 'saturated jobs'.

The work organisation of saturated jobs is characterised by high job resources and high job demands. The high level of job resources in saturated jobs is illustrated by the results

which show that for: job discretion, 79.3% of jobs involve having control over methods ($M = 1.76$); social support, 76.9% of jobs have a high level of assistance from colleagues ($M = 3.75$); and, for job variety, 63.7% of jobs involve task rotation ($M = 1.59$). The high level of job demands in saturated jobs is illustrated by the results which show that for: workload, 57.7% of jobs involve working at a high speed for more than half the time ($M = 3.98$); cognitive demands, 60.1% of jobs involve a high level of intellectual demand ($M = 3.51$); job complexity, 92.4% of jobs involve working on unforeseen problems ($M = 1.83$), and that for interaction demands, 62.7% of jobs involve working with people other than colleagues for more than half the time ($M = 4.58$). Teamwork is also a particular feature of saturated jobs, with 77% employees in this cluster reporting that they work in a team.

With regard to the skills and development dimension of job quality, although 67.4% of employees in saturated jobs agree that they have opportunities to learn and grow, the overall level of development opportunities is moderate ($M = 3.38$). Training occurs at a moderately high level ($M = 1.39$), with 63.2% of employees in saturated jobs participating in some form of work-based training. Saturated jobs also typically have a high rate of pay ($M = 6.87$), the highest mean pay level of all the job types. A moderate proportion of saturated jobs receive some form of compensatory pay (52.1%) and a small proportion receive some form of group pay (22.0%) but these levels are higher than average (37.8 and 11.2% respectively).

Saturated jobs are further characterised by high levels of security, high working time flexibility and moderate to high levels of non-standard working hours. The majority of employees in saturated jobs perceive a high level of job security (77.4% do not agree that they will lose their job in the next six months) and a large majority of saturated jobs (89.1%) have permanent contracts. With regard to working time flexibility, almost all employees (98.5%) in saturated jobs have some choice over working time. But despite this choice, only 13.9% are able to work very fixed working hours and 71.3% of saturated jobs involving working a ten hour day for at least one day per month. This suggests that while employees may have some control over when they work, the high workload of a saturated job means that employees have less control over the amount of hours worked. The majority of saturated jobs involve working non-standard hours, with over two thirds involving regular weekend work. Saturated jobs also involve higher than average levels of shift work (30.7%) and night time working (45.1). With regard to employee voice and representation, saturated jobs involve a high level of engagement with a manager about workplace changes and task performance ($M = 1.65$).

While saturated jobs and active jobs are similar in some respects, they do have key differences. In particular, saturated jobs involve higher levels of team working, variety and job demands such as workload, interaction demands, ambient demands, physical demands, timing interdependency. The last three demands can be classified as hindrance demands, which are defined as demands likely to be appraised by the employee as potentially constraining personal development and work-related accomplishment (Podsakoff, LePine and LePine, 2007). However, saturated jobs and active jobs differ little in terms of challenge job demands such as complexity and intellectual demands, which

can be defined as job demands that are likely to be appraised as promoting personal growth and achievement. Saturated jobs are also slightly better paid, more likely to include pay from additional sources (e.g., compensatory pay), involve greater flexibility in terms of hours worked and are more likely to involve non-standard hours and long working days. Thus, the key differences between saturated job and active jobs appear to lie in the extent of team working, the level of workload, the level of hindrance demands and the extent of non-standard working hours.

4.3.3 Team-Based Jobs

All jobs in this cluster involved working in a team and the level of team autonomy was high, with 66.2% of jobs involving working in team in which team members decide on the division of tasks amongst themselves. As such jobs in this cluster were labelled as team-based jobs.

In addition to the high levels of team working, the work organisation of team-based jobs is characterised by high job resources, high job complexity and high cognitive demands. The high level of job resources in team-based jobs is illustrated by the results which show that for: job discretion, 71.6% of jobs involve having control over methods ($M = 1.70$); social support, 81.0% of jobs have a high level of assistance from colleagues ($M = 3.76$); and, for job variety, 68% of jobs involve task rotation ($M = 1.60$). The high level of job demands in team-based jobs is illustrated by the results which show that for cognitive demands, 59.1% of jobs involve a high level of intellectual demand ($M = 3.42$), and for job complexity, 86.3% of jobs involve working on unforeseen problems ($M = 1.79$). Workload is at a moderate level, with 49.8% of jobs involve working at a high speed for more than half the time ($M = 3.75$), whilst interaction demand is also at a moderate level, with 53.8% of jobs involve working with people other than colleagues for more than half the time ($M = 4.13$). Ambient demands and physical demands are relatively low in absolute terms, although the physical demand to stand or walk in the job is a requirement of 61.4% of team based jobs.

With regard to the skills and development dimension of job quality, although 60.5% of employees in team-based jobs agree that they have opportunities to learn and grow, team-based jobs have moderate development opportunities ($M = 3.16$). Training occurs at a moderate level ($M = 1.30$), with 52.1% of employees in team-based jobs participating in some form of work-based training in the last year. The average rate of pay in team-based jobs is just below the average ($M = 5.93$). A small to moderate proportion of team-based jobs receive some form of compensatory pay (30.3%) and only a small proportion receive some form of group pay (11%).

Team-based jobs are further characterised by high levels of security but low working time flexibility and low non-standard work hours. The majority of employees in team based jobs perceive a high level of job security (76.5% do not agree that they will lose their job in the next six months) and all have permanent contracts. Team based jobs typically involve working the same fixed hours each week (72% having very fixed working times) to a schedule that is set by the organisation (99.7% of schedules are set by the organisation). However, team based jobs do not typically involve working non-standard hours (e.g., 4.4%

involve shift work, 28.4% involve Saturday work) and less than one-fifth involve work a ten hour day each month.

Team-based jobs have certain similarities to active jobs with regard to job design, job security and standard working hours. But key differences are that team-based jobs have high levels of team work and far lower flexibility over working time arrangements

4.3.4 Passive-Independent Jobs

The work organisation of jobs in this cluster was characterised by job demands at a low level and job resources at either a low or moderate level. The low level of job demands in this cluster is illustrated by the results which show that: for workload, only 42.4% of jobs involve working at a high pace more than half the time ($M = 3.59$); for cognitive demands, only 39.6% of jobs involve a high level of intellectual demand ($M = 2.78$), and for job complexity, only about half of jobs (48.5%) involve working on complex tasks ($M = 1.59$). Ambient demands ($M = 2.01$) and physical demands ($M = 3.33$) are relatively low in absolute terms, although the physical demand to stand or walk in the job is a requirement of 59.8% of passive-independent jobs. The low to moderate levels of job resource in this cluster is illustrated by the results which show that for: job discretion, only 52.8% of jobs have control over methods ($M = 1.52$); social support, 58.5% of jobs have a high level of assistance from colleagues ($M = 3.07$); and, for job variety, only 20.7% of jobs involve rotating tasks with colleagues ($M = 1.17$). The combination of low job demands and low job resources resembles the 'passive jobs' of job demands-control theory (Karasek & Theorell, 1990). A further feature of work organisation in this cluster is that only 23.7% involved working in teams and none of these jobs involved working in teams with a degree of autonomy over tasks or the choice of leader. Furthermore, timing interdependency was low ($M = 1.34$), with the pace of work in 34.9% of jobs depending on work colleagues and the pace of work on 20.6% of jobs depending on machines. This suggests that jobs in this cluster are relatively independent in nature as they do not involve close working with other employees. It is for these reasons that jobs in this cluster were labelled as passive-independent.

Passive-independent jobs are characterised by low development opportunities ($M = 2.75$) and low levels of training ($M = 1.13$), with only 28.2% of employees in passive-independent jobs receiving training at work in the last 12 months. Pay is just below the average ($M = 5.55$), with about one quarter (26.7%) of jobs including some form of compensatory pay, and 4.4% including group pay, both below average levels.

Job security is high in passive-independent jobs, as 75% of employees in such jobs do not agree that they will lose their job in the next six months and all report having a permanent contract. But although job security is high, the level of working time flexibility is low. Seventy-seven percent of passive-independent jobs involve working very fixed hours and almost all (99.7%) involve working to a time schedule that is set by the organisation. Nor do passive-independent jobs typically involve working non-standard working hours, as shift work (5.5% of jobs) and weekend work (e.g., 28.7% of jobs involve Saturday work) is uncommon and only 13.2% of jobs involve working at least one ten hour day each month.

4.3.5 High-Strain Jobs

Jobs in this cluster have a number of interesting attributes with regard to job demands. First, jobs have a high level of complexity ($M = 1.69$) but a relatively low level of cognitive demand ($M = 3.08$). This can be illustrated by the findings which show that 80.8% of jobs involve working on unforeseen tasks but only 46.3% of jobs involving working on intellectually demanding tasks. Second, the level of workload is relatively high ($M = 3.99$) and timing interdependency is higher than in any other cluster ($M = 1.44$). Third, although the level of physical demand (3.80) and ambient demand (2.53) are relatively low, they are higher than that in all the other clusters. In particular, the physical demands for standing or walking (72.7%) and for repetitive movement (58.4%) is high. Overall, level of job demand in this cluster is relatively high, except for cognitive demand, which is relatively low.

A further feature of work organisation in this cluster is that job discretion is low ($M = 1.53$). Only about half of jobs have some form of job discretion, which is much lower than average, and while about two thirds of jobs involve working in a team, few jobs involve the exercise of some form of team autonomy. The combination of high job demands and relatively low job discretion in this cluster resembles the 'high-strain jobs' of the job demands-control theory (Karasek & Theorell, 1990). According to this theory, a restriction on an employee's ability to respond to job demand reduces the likelihood that they will be able to cope with that demand or develop new ways of meeting that demand. As a result, employees in jobs that combine high job demands and low job discretion are likely to experience low well-being, i.e., high strain. It is for this reason that we have labelled this cluster 'high-strain jobs'.

With regard to skills and development, only 44% of employees in high-strain agree that they have opportunities to learn and grow and the overall level of development opportunities is low ($M = 2.79$). Training occurs at a moderate level ($M = 1.28$), with 51% of employees in high-strain jobs participating in some form of work-based training in the last year. The average rate of pay in high-strain jobs is just above average (5.97) and a large proportion of high-strain jobs include some form of compensatory pay (59.6%) and only a small proportion including some form of group pay (12.6%).

The level of security is high in high-strain jobs, with the majority (72.7%) in such jobs reporting that they will not lose their jobs in the next six months and almost all (99.9%) have a permanent contract. With regard to working time flexibility, about one-third have very fixed work times and working time is set by the organisation in almost all jobs (99.6%). It is therefore likely that, in high-strain jobs, working time flexibility is organised primarily to meet the demands of the organisation rather than the needs of the employee (Chung et al., 2007). Work time schedules in high-strain jobs also typically involve working non-standard hours (e.g., 57.6% include shift work, 61.5% include night work, 87.6% include Saturday work) and just over half of high-strain jobs involve working at least one ten hour day each month.

Overall, high-strain jobs can be characterised as combining high job demand, low to moderate job resources and low skill development with high security, an organisationally-focused working time flexibility and high non-standard working hours.

4.3.6 Insecure Jobs

Almost all jobs in this cluster (99.9%) had a non-permanent contract (e.g., agency contract, fixed term) and 46.3% agreed that they might lose their job in the next six months compared to the average of 26.8%. For these reasons, the jobs in this cluster were labelled as insecure. A further defining attribute of jobs in this cluster was low pay. The average level of pay was 4.03, far below the average pay level of 5.70, and far below the average pay of passive jobs ($M = 5.56$), the next lowest paid job type.

The work organisation of insecure jobs is characterised by moderate levels of job resource. This is shown by the results in Table 5 which show that for job discretion, 54% of jobs have control over task methods ($M = 1.52$), while for job variety, 48% of jobs involve task rotation ($M = 1.14$). With regard to job demands, insecure jobs have a moderate level of complexity ($M = 1.61$) but a relatively low level of cognitive demand ($M = 2.72$). For example, although 71.4% of jobs involve working on unforeseen tasks, only 36.5% of jobs involve working on intellectually demanding tasks. Workload is at a moderate level ($M = 3.78$) (e.g., 51.4% of jobs involve working at a high speed for more than half the time), as are interaction demands ($M = 4.97$). The level of physical demand ($M = 3.60$) and ambient demand (2.15) is relatively low although it can be noted that the physical demands for standing or walking (68.3%) and for repetitive movement (56.1%) are high. Overall, job demand in insecure jobs is characterised by relatively high physical demands, moderate levels of workload and job complexity and a low level of cognitive demand.

Insecure jobs are also characterised by low development opportunities ($M = 2.83$), with only 48.4% of employees in insecure jobs agreeing that they have opportunities to learn and grow. Training occurs at a low level ($M = 1.22$), with 43.1% of employees in insecure jobs having participated in some form of work-based training in the last year.

With regard to working time flexibility, working very fixed hours is a feature of just over half (53.1) of jobs, while working time is set by the organisation involve in about three-quarters of jobs (75.1%). Insecure jobs therefore appear to have little working time flexibility. Furthermore, a small but significant proportion of insecure jobs involve working non-standard hours. For example, 20.3% involve shift work, 42.2% involve evening work, 52.2% involve Saturday work, while just over one quarter (28.5%) involve working at least one ten hour day each month.

4.3.7 Overview of Job Types

Table 4.2 shows the general level of each dimension of job quality in each job type. From this it is evident that the six job types have a number of similarities and differences. For example, active, saturated and team-based jobs have a work organisation that could be defined as being of a high or moderately high quality, as all have a work organisation that consists of high job resources and a high level of key job demands such as job complexity and cognitive demand. However, an important difference within these three job types is the higher level of hindrance demands in saturated jobs. In contrast, passive-independent, high-strain and insecure jobs all have a work organisation that could be defined as being of a low to moderately low quality, as all have a work organisation characterised by low to moderately low job resources and a low level of intellectual cognitive demand, whilst other job demands are either at a high or a low level.

A further distinction lies between the active and saturated job types and the four other job types. Active and saturated jobs tend to have high work time flexibility, higher levels of pay and higher skills and development factors. A third distinction occurred with regard to working non-standard hours. Saturated jobs and high-strain jobs tended to involve working non-standard hours, whereas the other four job types did not. A final significant distinction lies between insecure jobs with a low level of job security, and the other five job types with high levels of job security.

Based on the above analysis, the six job types appear to be distinguishable according to four dimensions, namely a) work organisation; b) a dimension consisting of working time flexibility, pay and skills and development; c) non-standard working hours; and, d) job security.

Table 4.1a: Job Types and Work Organisation: Job Resources

Characteristic	Measure	Active Job	Saturated Job	Team-Based	Passive Job	High-Strain	Insecure Job	Mean	Scale
Job resources	Job discretion	1.83	1.76	1.70	1.52	1.52	1.53	1.63	1-2
	Task order	84.1	75.6	67.9	47.8	46.7	47.3	59.8	% Yes
	Methods	83.0	79.3	71.6	52.8	53.3	54.0	64.1	% Yes
	Pace of work	83.7	73.1	71.0	57.1	56.4	57.1	65.4	% Yes
	Variety	1.39	1.59	1.60	1.17	1.53	1.41	1.43	1-2
	Rotating tasks	44.5	63.7	68.0	20.7	60.4	48.0	48.7	% Yes
	Using different skills	35.5	54.8	53.4	14.6	46.3	34.2	37.6	% Yes
	Social support	3.61	3.75	3.76	3.07	3.41	3.37	3.46	1-5
	From colleagues	74.5	76.9	81.0	58.5	75.1	70.8	71.8	% 4-5
	From supervisor	65.1	67.7	66.8	50.0	58.2	60.3	60.4	% 4-5
	Work in a team	56.3	77.0	100	23.7	69.4	56.8	60.6	%
	Team autonomy	1.25	1.37	1.50	1.00	1.24	1.22	1.24	1-2
	Decide on distribution of tasks	33.4	47.3	66.2	0	33.1	29.7	32.1	% Yes
Decide on leader	16.5	27.6	34.5	0	15.8	15.4	16.7	% Yes	

Note: % 4-5 is percentage responding either 'Often' or 'Always'.

Table 4.1b: Job Types and Work Organisation: Job Demands

Characteristic	Measure	Active Job	Saturated Job	Team-Based	Passive Job	High-Strain	Insecure Job	Mean	Scale
Job demands	Physical demands	2.62	3.12	3.26	3.33	3.80	3.60	3.31	1-7
	Tiring position	14.8	25.5	28.8	30.0	37.7	33.6	29.1	%4-7
	Heavy loads	9.0	15.6	17.2	19.3	27.1	24.7	19.2	%4-7
	Standing/walking	37.4	55.5	61.4	59.8	72.7	68.3	59.9	%4-7
	Repetitive movements	40.4	45.2	49.9	53.0	58.4	56.1	51.0	%4-7
	Ambient demands	1.60	2.00	2.01	2.01	2.53	2.15	2.05	1-7
	Workload	3.51	3.98	3.75	3.59	3.99	3.78	3.76	1-7
	Working at high speed	36.3	57.7	49.8	42.4	56.1	51.2	48.8	%4-7
	Working to tight deadline	44.4	59.6	50.0	45.5	57.6	47.9	50.2	%4-7
	Cognitive and emotional demands	3.29	3.51	3.42	2.78	3.08	2.72	3.09	1-5
	Intellectual demands	62.3	60.1	59.1	39.6	46.3	36.5	49.1	%4-5
	Emotional demands	37.1	47.5	38.1	31.1	38.2	32.3	38.7	%4-5
	Interaction demands	3.96	4.58	4.13	3.75	3.75	3.93	3.98	1-7
	Interact with non-work colleagues	50.7	62.7	53.8	47.7	46.9	49.2	51.2	%4-7
	Timing Interdependency	1.30	1.39	1.42	1.34	1.44	1.37	1.37	1-2
	Dependent upon colleagues	40.1	53.5	56.6	34.9	54.0	47.0	46.8	% Yes
	Dependent upon colleagues	43.2	51.4	45.2	39.9	49.3	36.3	43.6	% Yes
Dependent upon machine	10.7	20.0	16.4	20.6	29.3	18.4	19.4	% Yes	
Complexity	1.81	1.83	1.79	1.59	1.69	1.61	1.70	1-2	
Unforeseen problems	85.5	92.4	86.3	71.0	80.8	71.4	80.5	% Yes	
Complex tasks	73.0	75.2	70.0	48.5	61.1	47.9	61.0	% Yes	
Learning new things	81.9	81.9	81.9	58.2	68.1	63.8	71.2	% Yes	

Note: % 4-5 is percentage responding either 'Often' or 'Always'; %4-7 is percentage responding 'Half the time' or greater.

Table 4.1c: Job Types by Skills and Development

Characteristic	Measure	Active Job	Saturated Job	Team-Based	Passive Job	High-Strain	Insecure Job	Mean	Scale
Skills and development	Training	1.33	1.39	1.30	1.13	1.28	1.22	1.26	1-2
	Any training in last year	58.6	63.2	52.1	28.2	51.0	43.1	47.5	% Yes
	Development opportunities	3.33	3.38	3.16	2.75	2.79	2.83	3.00	1-5
	Career advancement opportunities	36.8	46.0	34.6	24.5	25.8	28.1	31.8	% 4-5
	Opportunities to learn	66.8	67.4	60.5	42.8	44.0	48.4	53.6	% 4-5
	Skill utilization/correspondence	53.2	49.3	56.7	53.0	52.7	48.4	52.1	% Yes

Note: % 4-5 is percentage responding either 'Agree' or 'Strongly Agree'.

Table 4.1d: Job Types: Pay and Reward and Engagement

Characteristic	Measure	Active Job	Saturated Job	Team-Based	Passive Job	High-Strain	Insecure Job	Mean	Scale
Wage	Wage level	6.41	6.84	5.93	5.55	5.97	4.03	5.69	1-10
	Compensation pay	1.10	1.27	1.11	1.10	1.30	1.16	1.17	1-2
	At least one type of compensation pay	26.7	52.1	30.3	26.7	59.6	35.9	37.8	% Yes
	Group pay	1.07	1.11	1.05	1.01	1.05	1.02	1.05	1-2
At least one type of group pay	16.6	22.0	11.0	4.4	12.6	5.8	11.2	% Yes	
Engagement	Engagement and consultation	1.55	1.65	1.55	1.35	1.49	1.45	1.49	1-2
	Discussion with boss about performance	55.8	63.7	52.3	36.5	46.8	48.1	49.3	% Yes
	Regular formal assessment	41.2	54.5	47.5	25.7	43.0	38.9	40.5	% Yes
	Consulted about changes	57.1	69.8	53.0	33.5	46.4	41.8	48.5	% Yes

Note: Elements of *Compensation pay* include payments for overtime, dangerous working conditions, Sunday work. Elements of *Group pay* include company-based performance, company shares, and group based performance.

Table 4.1e: Job Types by Security and Flexibility

Characteristic	Measure	Active Job	Saturated Job	Team-Based	Passive Job	High-Strain	Insecure Job	Mean	Scale
Security	Job security	4.23	4.13	4.07	4.07	4.02	3.39	3.96	1-5
	% Disagreeing that might loose job	83.3	77.4	76.5	75.0	72.7	53.7	72.5	% 4&5
	Full-time	79.8	85.6	87.9	85.9	90.4	72.1	83.2	% Yes
	Permanent contract	96.8	89.1	100	100	99.9	0.01	78.8	% Yes
Flexibility	Fixed-time schedules	1.64	1.39	1.86	1.88	1.57	1.71	1.69	1-2
	Fixed hours daily, weekly & fixed starting and finishing times	38.3	13.9	72.4	77.4	32.6	53.2	50.0	% Yes
	Working time set by organisation	0.0	1.5	100	99.7	99.6	75.1	66.0	% Yes
	Shift-work	3.0	30.3	4.4	5.5	57.6	20.3	19.7	% Yes
	Night work	0.5	45.1	1.6	1.8	61.5	19.8	20.6	% Yes
	Evening work	20.0	90.2	17.2	14.4	89.9	42.2	43.6	% Yes
	Sunday work	1.5	63.4	3.6	3.7	67.4	25.4	25.9	% Yes
	Saturday work	17.2	83.7	24.4	28.7	87.6	52.2	47.8	% Yes
10 hour day	28.0	71.3	18.8	13.2	55.8	28.5	34.0	% Yes	

Note: % 4-5 is percentage responding either 'Disagree' or 'Strongly Disagree'.

Table 4.2: Summary of Job Types

	Work Organisation		Skills and Development	Pay and Reward	Security and Flexibility		Collective Representation and Voice
	Job Resources	Job Demands			Security	Flexibility	
Active	High	High complexity & cognitive demand Other Moderate to Low	Moderate to High	Moderate to High	High	High work time flexibility Low non-standard hrs	Moderate
Saturated	High	High	High	High	High	High work time flexibility High non-standard hrs	High
Team-Based	High	Moderate to High	Moderate	Moderate	High	Low work time flexibility Low non-standard hrs	Moderate
Passive-Independent	Low	Low	Low	Low	High	Low work time flexibility Low non-standard hrs	Low
High-Strain	Low/Moderate	High but Cognitive Demand Low	Low to moderate	Moderate	High	Low work time flexibility High non-standard hrs	Moderate
Insecure	Moderate	High physical, Low cognitive demand Other Moderate to Low	Low	Low	Low	Low work time flexibility Low non-standard hrs	Moderate/Low

4.4 Job Types, Job Quality and Employee Well-Being

The aim of the second stage of the analysis was to establish, for each job type, the mean level of total job quality and the mean level of employee well-being. Examining the differences between job types with regard to job quality and well-being will aid interpretation of the job types and to help validate the taxonomy of job types.

4.4.1 Job Quality

The descriptive results (see Table 4.3) show that there are three jobs types with a higher than average job quality ($M = 56.22$). These are active jobs ($M = 64.07$), saturated jobs ($M = 62.70$) and team-based jobs ($M = 58.81$). There are also three jobs types with lower than average job quality and they are passive ($M = 52.31$), high-strain ($M = 50.69$) and insecure jobs ($M = 52.35$). The results of an ANOVA analysis revealed that the level of job quality: in active jobs is significantly higher than in all the other job types (all $p < .05$); in saturated jobs is significantly higher than all other jobs types except active jobs (all $p < .05$), and in team-based jobs it is significantly higher than all other job types except active and saturated jobs (all $p < .05$). There were no significant differences in job quality between passive-independent, high-strain and insecure jobs but job quality in all these job types was significantly lower than in active, saturated and team based jobs (all $p < .05$).

Table 4.3: Job Quality and Employee Well-Being by Job Type

	Job Quality	Employee Well-Being					
		Job Satisfaction		Physical Well-Being		Psychological Well-Being	
	M	M	% ¹	M	% ²	M	% ²
Active	64.07	3.24	34.7	1.83	76.7	1.86	78.5
Saturated	62.70	3.16	29.4	1.75	64.0	1.79	67.8
Team-Based	58.81	3.12	24.8	1.76	65.3	1.80	68.1
Passive	52.31	3.01	21.8	1.80	71.0	1.81	72.3
High-Strain	50.96	2.81	14.0	1.68	51.0	1.73	56.9
Insecure	52.35	2.90	20.9	1.76	64.6	1.77	66.4
<i>Average</i>	<i>56.22</i>	<i>3.03</i>	<i>23.9</i>	<i>1.77</i>	<i>65.7</i>	<i>1.79</i>	<i>68.4</i>

¹ % 'Very Satisfied'.

² % Reporting no physical/psychological well-being problems.

4.4.2 Employee Well-Being

Recall that the three measures of employee well-being were job satisfaction, physical well-being and psychological well-being. Differences in employee well-being between job types were examined using ANCOVA with a well-being measure as the dependent variable and the job type measure as the independent variable. The covariates or controls were employee age, gender, organisational size, educational level (ISCED, with each educational level included as a dummy variable), occupational type (ISCO with each

occupational type included as a dummy variable) and economic sector (NACE Second Level, with each sector included as a dummy variable)

The mean scores are shown in Table 4.3 and the pattern of significant differences between job types is summarised in Table 4.4 and Table 4.5. These tables show that the level of well-being in active jobs and high-strain jobs is distinctly different from that in all other job types. Active jobs have a significantly higher level of job satisfaction ($M = 3.15$, all $p < .01$), physical well-being ($M = 1.77$, all $p < .05$) and psychological well-being ($M = 1.79$, all $p < .05$) than all other job types; the only exception being a non-significant difference with insecure jobs in relation to psychological well-being. In contrast, high-strain jobs have a significantly lower level of job satisfaction ($M = 2.84$), physical well-being ($M = 1.64$) and psychological well-being ($M = 1.71$) (all $p < .01$) than all other job types. These differences are further illustrated by results showing that 34.7% of employees in active jobs are very satisfied as opposed to 20.9% in high-strain jobs, that 76.7% of employees in active jobs report no work-caused physical health problems as opposed to 51% in high-strain jobs, and 78.5% of employees in active jobs report no work-caused psychological health problems as opposed to 56.9% in high-strain jobs.

Table 4.4: Significant Differences in Job Quality and Job Satisfaction between Job Types

	Job Quality						Job Satisfaction					
	Act	Sat	Team	Pass	H-S	Ins	Act	Sat	Team	Pass	H-S	Ins
Active	-	H	H	H	H	H	-	H	H	H	H	H
Saturated	L	-	H	H	H	H	L	-	H	H	H	H
Team-Based	L	L	-	H	H	H	L	L	-	H	H	H
Passive	L	L	L	-	ns	ns	L	L	L	-	H	ns
High-Strain	L	L	L	ns	-	ns	L	L	L	L	-	H
Insecure	L	L	L	ns	ns	-	L	L	L	L	H	-

Note: Read across rows. H indicates that the job type in the row is significantly higher than the job type in the column. L indicates that the job type in the row is significantly lower than the job type in the column. NS indicates no significant difference.

Table 4.5: Significant Differences in Physical and Psychological Well-Being between Job Types

	Physical Well-Being						Psychological Well-Being					
	Act	Sat	Team	Pass	H-S	Ins	Act	Sat	Team	Pass	H-S	Ins
Active	-	H	H	H	H	H	-	H	H	H	H	ns
Saturated	L	-	L	L	H	L	L	-	ns	L	H	L
Team-Based	L	H	-	L	H	L	L	ns	-	ns	H	ns
Passive	L	H	H	-	H	ns	L	H	ns	-	H	ns
High-Strain	L	L	L	L	-	L	L	L	L	L	-	L
Insecure	L	H	H	ns	H	-	ns	H	ns	ns	H	-

Note: Read across rows. H indicates that the job type in the row is significantly higher than the job type in the column. L indicates that the job type in the row is significantly lower than the job type in the column. NS indicates no significant difference.

Saturated jobs have the second highest mean level of job satisfaction ($M = 3.06$) but the second lowest levels of physical well-being ($M = 1.68$) and psychological well-being ($M = 1.74$). Job satisfaction in saturated jobs is significantly lower than in active jobs ($p < .01$), at a similar level to that in team-based jobs, and is significantly higher than in passive-independent, high-strain and insecure jobs (all $p < .05$). Physical well-being in saturated jobs is significantly lower than in all other jobs types except high-strain jobs ($p < .05$) and is significantly higher than in high-strain jobs ($p < .01$); while psychological well-being is significantly lower than in active jobs, passive-independent jobs and insecure jobs (all $p < .05$), at a similar level to that in team-based jobs, and is significantly higher than in high-strain jobs ($p < .01$).

Team-based jobs have the third highest mean level of job satisfaction ($M = 3.05$) and the fourth highest levels of physical well-being ($M = 1.71$) and psychological well-being job ($M = 1.75$). In particular, the level of job satisfaction in team-based jobs is lower than in active jobs ($p < .01$), at a similar level to that in saturated jobs, and is higher than in passive, high-strain and insecure jobs (all $p < .05$). The level of physical well-being in team-based jobs is significantly lower than in active jobs and passive-independent jobs (all $p < .05$) but is significantly higher than that in saturated, high-strain and insecure jobs (all $p < .05$). The level of psychological well-being in team-based jobs is significantly lower than in active jobs ($p < .01$), is similar to that in saturated, passive-independent jobs but insecure jobs and is significantly higher than that in high-strain jobs ($p < .05$),

Passive-independent and insecure jobs have relatively low levels of job satisfaction but have relatively higher levels of physical well-being and psychological well-being. Passive-independent jobs have the fourth highest level of job satisfaction ($M = 3.00$), and the second highest level of physical well-being ($M = 1.74$) and psychological well-being ($M = 1.78$), while insecure jobs have the fifth highest level of job satisfaction ($M = 3.96$), and the third highest level of physical well-being ($M = 1.73$) and psychological well-being

($M = 1.77$). There are no significant differences in physical and psychological well-being between passive-independent and insecure jobs, although passive-independent jobs do have a slightly higher level of job satisfaction ($p < .05$). In comparison to other job types, both passive-independent and insecure jobs have a higher level of job satisfaction than high-strain jobs but a lower level of job satisfaction than active jobs, saturated jobs and team-based jobs. The levels of physical well-being for both passive-independent and insecure jobs are significantly higher than for saturated, team-based and high-strain jobs but significantly lower than for active jobs; while the levels of psychological well-being for both passive-independent and insecure jobs are significantly higher than for saturated and high-strain jobs but significantly lower than for active jobs and team-based jobs.

Overall, there are clear differences in the job quality of the job types and the existence of such differences helps to support the validity of the job types. Three job types have a higher than average level of job quality, i.e., active, saturated and team based jobs, and these job types have many of the characteristics that are typically seen to properties of high quality, high-commitment jobs. Three job types have a lower than average level of job quality, i.e., passive-independent, insecure and high-strain jobs and these job types have many of the characteristics that are typically seen to be properties of low quality, low-commitment jobs.

The level of job quality also reflected the level of employee well-being for three jobs types. Active jobs had the highest job quality and employee well-being, high-strain jobs had the lowest level of job quality and well-being, while team-based jobs were ranked in the middle in terms of job quality and employee well-being. For the other three job types, the level of job quality was related to the level of job satisfaction but less well related to the level of physical well-being and psychological well-being. Saturated jobs have the second highest level of job quality and the second highest level of job satisfaction but have the second lowest levels of physical well-being and psychological well-being. The high level of job satisfaction may be a result of high job resources, challenging demands and pay. But the relatively low levels of physical and psychological well-being may be caused by a combination of factors, i.e., high physical demands combined with high workload, long hours and non-standard working hours; and these factors may also act synergistically to have a particularly detrimental impact on physical and psychological well-being in saturated jobs. In contrast to saturated jobs, passive-independent and insecure jobs have relatively low levels of job satisfaction but have relatively higher levels of physical well-being and psychological well-being. The low levels of satisfaction are likely to be a result of the low levels of job resources, challenging job demands, pay and working time flexibility, whilst the relatively higher levels of physical and psychological well-being are likely to be a result of the comparatively low levels of demand.

The highest quality jobs with the most favourable outcomes are active jobs, and the lowest quality jobs with the least favourable outcomes are high-strain jobs. Saturated jobs are of a relatively high quality and have favourable outcomes in terms of job satisfaction, but appear somewhat problematic with regard to physical and psychological well-being. Passive –independent and insecure jobs appear to be of a low quality and appear problematic with regard to employee job satisfaction.

4.5 Job Types by Employee Characteristics and Institutional Regime

The aim of the third stage of the analysis was to examine the distribution of job types amongst occupational groups, demographic groups, and countries. This analysis will provide important information about who has access to high quality job types and help to confirm the validity of the job types if they are distributed amongst different groups in expected ways. For example, we might expect higher quality job types to be more prevalent in highly skilled occupational groups and amongst employees with high levels of education. We also conducted the analyses with and without weighting (country size, selection probability) and a similar pattern of results was obtained.

4.5.1 Occupational Group

Table 4.6 shows the proportion of jobs with a particular job type within each occupational group. The results show three general trends. First, the more highly skilled occupational groups, ISCO 1 to 3, typically have higher than average proportions of higher quality job types. For example, both Legislator (ISCO 1) and Professional (ISCO 2) occupational groups have higher than average proportions of active jobs (26.4% and 20.6% respectively) and saturated jobs (33.9% and 21.7% respectively), whilst the Technician (ISCO 3) occupational group has a higher proportion of active jobs (26.9%) and a slightly higher proportion of team-based jobs (17.2%).

Table 4.6: Occupational Group by Job Type (ISCO first-level)

	Active	Saturated	Team-Based	Passive	High-Strain	Insecure
ISCO 1: Legislators, senior officials and managers	26.4	33.9	10.8	12.1	7.8	9.1
ISCO 2: Professionals	20.6	21.7	16.9	16.8	12.1	12.0
ISCO 3: Technicians and associate professionals	26.9	13.5	17.2	16.1	12.4	13.9
ISCO 4: Clerks	23.1	7.0	14.3	26.9	8.0	20.6
ISCO 5: Service workers and shop and market sales workers	11.8	16.6	10.4	16.0	21.3	24.0
ISCO 6: Skilled agricultural and fishery workers	7.2	15.7	22.2	13.1	9.2	32.7
ISCO 7: Craft and related trades workers	10.3	5.7	17.9	27.8	17.4	20.9
ISCO 8: Plant and machine operators and assemblers	4.9	11.2	8.4	24.2	34.2	17.1
ISCO 9: Elementary occupations	10.1	8.0	9.4	25.8	16.1	30.6
ISCO 0: Armed forces	2.3	14.0	4.7	1.6	36.4	41.1
<i>% of each job type</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

Second, ISCO groups 4 to 7 have a higher than average proportion of one type of high quality job, but also have a higher than average proportion of one or more low quality job types. For example, the Clerks (ISCO 4) occupational group has a higher than average proportion of active jobs (23.1%) and a higher proportion of passive jobs (26.9%), while the Service (ISCO 7) occupational group has a higher than average proportion of saturated jobs (16.6%) and a higher proportion of high-strain jobs (21.3%) and insecure jobs (24.0%).

Third, ISCO groups 8 and 9 typically have higher than average proportions of lower quality job types. For example, the Plant and Machine Operator (ISCO 8) occupational group has a higher than average proportion of passive-independent jobs (23.1%) and a higher proportion of passive jobs (26.9%), while the Elementary occupational group (ISCO 9) has a higher than average proportion of passive-independent jobs (25.8%) and insecure jobs (30.6%).

4.5.2 Educational Level

Table 4.7 shows the proportion of each job type within each educational level. The general trend is that, as the level of education increases, so does the proportion of jobs with a higher job quality. For example, amongst the group of employees with an advanced tertiary education (ISCED 6), there is a higher than average proportion of active jobs (23.5%) and a slightly higher than average proportion of saturated jobs (26.7%). In contrast, amongst the employees with a primary education (ISCED 1), there is a higher than average proportion of passive-independent jobs (31.9%) and insecure jobs (27.1%), and a slightly higher than average proportion of high-strain jobs (17.9%).

Table 4.7: Educational Level by Job Type

ISCED classification: Highest Level of Education or Training	Active	Saturated	Team- Based	Passive	High- Strain	Insecure
No education	2.8	0.9	7.5	25.5	22.6	40.6
Primary education (ISCED 1)	6.7	4.0	12.3	31.9	17.9	27.1
Lower secondary education (ISCED 2)	12.8	8.7	12.9	26.6	17.3	21.6
Upper secondary education (ISCED 3)	14.4	11.0	13.2	21.9	18.2	21.3
Post-secondary: pre- vocational or vocational (ISCED 4)	21.0	14.8	13.1	18.0	15.3	17.9
Tertiary education: first level (ISCED 5)	23.7	21.5	16.2	14.3	10.6	13.7
Tertiary education: advanced level (ISCED 6)	23.5	26.7	13.7	15.3	10.2	10.6
<i>% of each job type</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

4.5.3 Organisational Size

The proportion of jobs with a particular job type by occupational size is shown in Table 4.8. The results show that as the size of the organisation increases, the proportion of active jobs, saturated and high-strain jobs increases, whilst the proportion of passive and insecure jobs decreases. The proportion of team-based jobs increases with organisational size until organisations of 50-99 employees and then decreases. It can also be noted that, amongst employees who work alone, a small proportion have saturated jobs (5.5%) and high-strain jobs (4.0%), none work in team based jobs, and a high proportion work in passive-independent jobs (33.8%) and insecure jobs (40.6%).

Table 4.8: Organisational Size by Job Type

Organisation Size	Active	Saturated	Team-Based	Passive	High-Strain	Insecure
1 (works alone)	15.7	5.5	0	33.8	4.0	40.6
2-4	15.7	12.1	11.3	25.5	9.9	25.4
5-9	14.1	13.4	15.7	21.6	12.1	23.0
10-49	16.1	13.5	15.5	23.3	13.7	17.7
50-99	17.3	12.1	16.2	19.2	16.3	18.9
100-249	17.3	15.5	13.1	19.0	21.3	13.7
250-499	17.9	15.7	14.0	14.3	22.9	15.2
500 and over	22.8	15.7	12.3	11.6	22.8	14.9
<i>% of each job type</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

4.5.4 Age and Gender

Table 4.9 shows the proportion of jobs with a particular job type by gender and age. The results show that a slightly higher proportion of men work in saturated jobs and high-strain jobs than women, whilst a slightly higher proportion of women work in active, team-based, passive and insecure jobs. With regard to age, the results suggest that as employees get older they are more likely to have an active, team-based or passive-independent jobs, and less likely to have an insecure job. Saturated jobs appear to be spread equally among workers of different ages, but workers between 30 to 49 years old appear slightly more likely to have high-strain jobs.

Table 4.9: Employee Gender and Age by Job Type

	Active	Saturated	Team-Based	Passive	High-Strain	Insecure
Male	15.0	15.4	12.9	19.4	19.6	17.6
Female	18.7	11.3	14.9	22.3	11.5	21.3
15-29	11.1	12.8	11.5	16.5	12.7	35.3
30-49	17.7	13.7	14.6	21.9	17.5	14.6
50+	20.7	13.6	14.5	22.6	15.0	13.6
<i>% of each job type</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

4.5.5 Country

To aid cross national comparison, countries within the EU are commonly classified as belonging to one of five groups (Parent-Thirion, et al., 2007; Valeyre et al., 2009). They are:

- Social Democratic, e.g., Denmark, Finland, Sweden, Norway and Netherlands.
- Continental, e.g., Austria, Belgium, Germany, France and Luxembourg
- Liberal, e.g., Ireland, UK.
- Southern European, e.g., Cyprus, Spain, Italy, Greece and Portugal.
- Eastern European, e.g., Czech Republic, Estonia, Lithuania, Latvia, Poland, Slovenia and Slovakia.

This classification is derived from work indicating that European countries can be distinguished according to differences in institutional regime (Amable, 2003; Esping-Anderson, 1990; Whitley, 1999). Moreover, a country's institutional regime has been shown to influence job quality in that country, such that national differences in institutional regimes lead to cross-national variation in job quality (Gallie, 2007; Holman et al., 2009).

In Social Democratic countries, institutional regimes are characterised as having policies designed to extend employment rights and employment rights throughout the working population. In addition, the participation of organised labour in decision making is highly institutionalised within organisations (e.g., works councils) and in relation to both the party in government and quality of work programmes; and central aims of organised labour are to promote employment growth and high levels of employment, to collaborate with employers in developing industry specific and vocational training programmes, and to curb pay differentials and enhance the pay of low paid workers (Culpepper & Thelen, 2007; Gallie, 2000; Kristensen & Lilja, 2010). A strategy to promote employment growth and high levels of employment will, if successful, protect union members from unemployment, increase the value of employees' skills and make the labour market much tighter. One likely outcome of a tight labour market will be to increase the capacity of employees and organised labour to secure better job conditions (e.g., work organisation) and employment conditions (e.g., basic wage levels, job security, flexible working arrangements), to gain greater influence in workplace decision-making and to resist practices deemed deleterious to well-being, e.g., standardization, excessive monitoring (Dobbin & Boychuk, 1999;

Gustavsen, 2007). The aim of organised labour to promote training may lead to a more highly skilled workforce (Lasonen & Rauhala, 2000), which may not only help to secure higher wage levels but may also permit the design of more complex jobs (Prais et al., 1989). Complex jobs typically have high levels of discretion and tend to be intrinsically motivating, and the resulting commitment means that employees are likely to require less direct control and monitoring (Parker & Wall, 1999). Furthermore, organised labour may be more successful in curbing pay differentials and enhancing the pay of low paid workers (Wallerstein, 1999). Finally, welfare policies in are designed to promote participation in the workforce of women and vulnerable groups (Esping-Andersen, 1990), which may help to reduce differences in job and employment conditions between different categories of employees, e.g., men/women, part-time/full-time (Mandel & Semyonov, 2006). From the above it is evident that a likely effect of an institutional regime in Social Democratic countries will be to promote job factors that are indicative of high job quality and likely to promote the development of high quality job types.

In Continental countries, institutional regimes are characterised by organised labour having a more consultative role within organisations and its influence is partly dependent upon the party of government. Organised labour therefore has a weaker capacity to realise its aims, such as promoting skill levels and wage rates. Another implication is that organised labour is likely to be strongest in those areas of the economy where it can easily mobilize the workforce, such as the core employees of large firms (Culpepper, 1999; Hyman, 2001). As a result, employment and working conditions may be better among the core employees of large firms than among employees with non-standard contracts or those working in smaller firms (Streeck, 1991; Thelen & Kume, 1999). The overall level of job quality in Continental countries is therefore likely to be lower than that in Social Democratic countries for two reasons. First, even in the core workforce, organised labour has less capacity to secure better employment conditions. Second, employment conditions will be lower in non-core employees and therefore depress the overall mean. Continental countries are therefore likely to have relatively high levels of high quality job types but at a lower level than that found in Social Democratic countries.

In Liberal countries, institutional regimes are characterised by little state intervention with regard to the regulation of working conditions which occurs, in part, because many institutional actors (e.g., employers, employments associations) assume that employment conditions and employment levels are best regulated by the market and that employment regulation generally reduces market effectiveness (Gallie, 2007). Organised labour has little involvement in decision-making within firms or the government and this is partly because some institutional actors view it as a competing interest group (Hyman, 2001). This reduces the capacity of organised labour to influence employment and working conditions. The lower levels of employment protection and employment create a relatively fluid labour market, which may make employers less willing to train because returns on such investments are less likely (Capelli et al., 1997; Finegold & Soskice, 1988). In turn, the lower skill level of employees inhibits the design of more complex jobs, which is likely to lead to jobs with lower discretion, higher levels of standardization and lower wage rates (Prais et al, 1989). Liberal countries are therefore likely to have a lower proportion of high quality jobs than Social Democratic or Continental countries.

In Southern-European countries, institutional regimes are characterised by relatively little state intervention with regard to the regulation of working conditions, while the power of organised labour to influence working conditions is relatively weak (Amable, 2003). State-sponsored training and education is limited and increasing liberalisation has led to lower job security, giving employers little incentive to invest in training (Patiniotis & Stravoulakis, 1997). As with Liberal countries, the low levels of employee skill inhibits the design of complex jobs, leading to low quality work organisation and lower wage rates (Prais et al, 1989). A further feature of Southern-European countries is that low skill sectors have historically been relatively large in comparison to Northern European countries (i.e., Social Democratic, Continental and Liberal Countries). As such, the institutional and sectoral make-up of Southern-European countries is likely to result in the greater prevalence of low quality jobs in comparison to Northern European countries.

Eastern-European countries, although diverse, are characterised by relatively little state intervention with regard to the regulation of working conditions and an organised labour movement that is relatively weak (Amable, 2003). Eastern-European countries are also characterised by relatively autocratic management structures (which will clearly limit the job discretion of employees and influence of organised labour), a degree of liberalisation that has decreased job security and the use of low cost training on the job (Amable, 2003). Low-skill sectors have also been relatively large in Eastern-European countries in comparison to Northern Europe. The institutional, historical and sectoral make-up of Eastern-European countries is therefore likely to result in the greater prevalence of low quality jobs in comparison to Northern European countries.

In summary, there are strong reasons to expect differences in the level of job quality between Social Democratic, Continental, Liberal, Southern-European and Eastern-European countries. In particular, we might expect the following distribution of job types between countries:

- Social Democratic countries will have the highest proportion of high quality job types.
- Continental countries will have a higher proportion of high quality job types than all other country groups but a lower proportion than in Social Democratic countries.
- Liberal countries will have a higher proportion of high quality job types than Southern-European and Eastern-European countries but a lower proportion than in Social Democratic and Continental countries.
- Southern-European and Eastern-European will have the lowest proportion of high quality job types.

From the results shown in Table 4.10, it is evident that the distribution of job types across countries is similar to that expected. Social Democratic countries have the highest proportion of high quality job types (65.5%), and just over one quarter of job are active jobs (28%). This pattern is evident across all Social Democratic countries. Continental countries have the second highest proportion of high quality job types (51%) but this is not much greater than the proportion of high quality jobs in Liberal countries (48.8%). Thus, while Social Democratic countries had higher proportion of high quality job types than Continental and Liberal countries as expected, Continental and Liberal countries had a

similar proportion of high quality jobs, which was not expected. However, there are interesting differences in the distribution of low quality job types between Continental and Liberal Countries. In Continental countries, the job types with the highest proportions are active jobs (22.3%) and passive-independent jobs (21.6%), whereas in Liberal countries the job type with the highest proportion is insecure jobs (24.6%) and other job types are more evenly distributed.

The proportion of high quality job types is lowest in Southern-European countries (29.3%) and in Eastern-European countries (32.3%). But there are differences in the distribution of low quality job types between Southern and Eastern-European countries. In Southern-European countries, the job types with the highest proportions are passive-independent jobs (29.5%) and insecure jobs (25.8%), whereas in Eastern-European countries the job types with the highest proportions are high-strain jobs (23.5%) and insecure jobs (24.3%).

Table 4.10: Job Type by Institutional Regime and Country

	Active	Saturated	Team-Based	Passive	High-Strain	Insecure
Social Democratic	28.0	25.8	11.7	6.4	15.1	13.0
Denmark	28.1	23.0	13.3	9.6	11.9	14.1
Finland	21.0	23.5	14.0	6.5	20.0	15.0
Sweden	31.3	28.4	9.8	4.3	14.8	11.5
Norway	21.0	19.5	17.1	7.3	25.4	9.8
Netherlands	30.1	22.3	12.0	6.1	11.4	18.1
Continental	22.3	14.8	13.9	21.6	13.7	13.6
Austria	23.2	14.3	16.3	17.7	13.8	14.8
Belgium	27.1	17.1	14.0	16.4	16.7	8.7
Germany	20.4	14.4	16.2	22.4	13.2	13.4
France	21.3	11.9	10.1	28.6	15.2	13.0
Luxembourg	26.7	13.3	20.0	20.0	13.3	6.7
Liberal	17.2	17.1	14.5	12.4	14.2	24.6
Ireland	15.2	15.9	15.2	11.7	10.3	31.7
United Kingdom	17.3	17.2	14.4	12.5	14.5	24.0
Eastern European	7.2	8.4	16.7	19.9	23.5	24.3
Czech Republic	5.9	14.8	14.8	19.6	25.1	19.9
Estonia	8.5	19.1	23.4	14.9	23.4	10.6
Lithuania	5.7	10.2	26.1	23.9	20.5	13.6
Latvia	8.4	8.4	30.1	13.3	25.3	14.5
Poland	7.5	6.7	15.2	17.8	20.6	32.2
Slovenia	10.0	13.8	20.0	10.0	27.5	18.8
Slovakia	8.3	11.9	14.3	19.0	30.4	16.1
Southern European	9.0	8.2	12.1	29.5	15.4	25.8
Cyprus	3.3	.0	10.0	20.0	13.3	53.3
Spain	7.1	7.1	13.5	29.1	13.4	29.8
Greece	3.1	7.0	13.6	19.9	15.3	41.1
Italy	13.4	11.1	9.6	29.5	17.2	19.3
Portugal	5.1	3.8	15.0	39.1	15.3	21.7
<i>% of each job type</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

4.6 Job Types by Growing and Declining Sectors of the Economy

The analysis so far has confirmed the existence of job types and has provided further evidence for the validity for these job types. In particular, the job types are distributed amongst different educational levels, occupational types, and groups of countries in ways that would be expected, e.g., high quality job types are more prevalent in skilled occupations, in Social Democratic countries and amongst employees with high qualifications. However, the main aim of this report is to examine the distribution of job types in growing sectors of the European economy, and it is to this issue that we now turn.

Table 4.11 shows the distribution of job types amongst the three main sectoral groups, i.e., agricultural, industrial and service sectors. Overall, it can be noted that the percentage of low quality jobs is higher than the percentage of high quality jobs and this occurs across all three of the sectoral groups. However, service sectors have the highest proportion of high quality jobs (46.7%) followed by industrial sectors (38.7%) and agricultural sectors (36.5%)

Table 4.11: Job Type by Groups of Sector

Sector	Job Type					
	Active	Saturated	Team-Based	Passive	High-Strain	Insecure
Agricultural Sectors	9.6	16.7	10.2	14.3	9.9	39.2
Industrial Sectors	14.9	9.9	14.4	25.0	19.2	16.6
Service Sectors	17.5	15.3	13.9	19.2	14.8	19.3
<i>Total</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

Although low quality jobs are more prevalent when focusing on sectoral groups, an analysis at the sectoral level (NACE Level 1) shows wide variations in the distribution of job types, particularly in the service sector. Table 4.11 shows that the service sectors with the highest proportion of high quality jobs include financial intermediation (65.9%), public administration (53%), business (51.8%) and health and social work (50.2%). In contrast, there are a number of service sectors with much lower proportions of high quality jobs, such as hotels and restaurants (33%), and retail (40.2%).

Table 4.12 shows the distribution of job types amongst growing and declining sectors of the economy. Focusing on differences between growing and declining sectors, the proportion of high quality jobs is higher in the growing sectors (46.8%) than in the declining sectors (38.2%), while the proportion of insecure jobs is higher in the growing sectors (20.3%) than in the declining sectors (16.9%) and the proportion of high-strain jobs is lower in the growing sectors (13.7%) than it is in the declining sectors (20.8% respectively).

Table 4.12: Job Type by Sector Growth (NACE Level 1)

Sector	Sector Growth	Sector Size (%)	Job Type					
			Active	Saturated	Team-Based	Passive	High-Strain	Insecure
High Quality Growing								
Business	3.40	6.9	24.3	18.8	8.7	20.1	8.1	20.0
Health & social work	1.21	8.0	15.6	21.8	12.8	10.9	21.0	17.8
Education	.47	9.0	13.8	10.7	22.1	23.8	10.9	18.7
Public administration	.19	8.4	28.1	11.0	13.9	13.9	16.9	16.2
Financial intermediation	.03	3.8	39.1	11.3	15.5	19.3	4.5	10.2
Low Quality Growing								
Construction	2.33	6.8	11.7	10.6	21.0	23.8	12.1	20.9
Retail	.62	14.6	12.4	12.7	15.1	24.8	13.3	21.7
Other services	.55	7.5	19.3	13.8	14.0	17.3	14.2	21.4
Private households	.47	0.5	7.7	3.1	1.5	23.1	3.1	61.5
Hotels and restaurants	.38	3.5	1.8	25.1	6.1	7.7	22.7	36.6
Total Growing		69	17.6	14.3	14.9	19.2	13.7	20.3
High Quality Declining								
Energy/Utilities	-.24	2.0	22.8	10.3	14.7	19.1	18.0	15.1
Low Quality Declining								
Mining	-.24	0.6	8.0	10.2	12.5	22.7	38.6	8.0
Transport and communication	-.34	6.1	11.4	18.5	9.4	22.5	22.9	15.4
Manufacture	-3.04	20.3	15.3	9.6	12.3	25.9	21.6	15.4
Agriculture and fishing	-3.62	2.0	9.3	16.5	10.0	14.3	10.0	39.8
Total Declining		31	14.6	11.9	11.7	24.1	20.8	16.9
Total		100	16.8	13.5	13.8	20.8	15.8	19.3

With regard to differences between the high quality and low quality growing sectors, the high quality sectors have a higher proportion of active jobs and a lower proportion of insecure jobs but there are no clear differences with regard to other jobs types.

Table 4.13 shows the ten growing sub-sectors (NACE Level 2) of the EU economy that have the highest proportions of low quality jobs. The estimates of job growth are drawn from Vandekerckhove & Ramioul (2010). Two features that are common to this group are that most sub-sectors have a higher than average proportion of passive-independent job

and insecure jobs, whilst high-strain jobs are only a noticeable feature of three of these sectors. A full list of the proportions of job types by each sub-sector can be found in Appendix C.

Table 4.13: Job Types by Growing Sub-Sectors with Highest Proportions of Low Quality Jobs (NACE Sub-Sector Level)

NACE Sub-Sectors	BART Growth	% Low quality jobs	Job Type					
			Active	Sat.	Team-Based	Passive	High-Strain	Ins.
Domestic staff	0.0036	87.69	7.69	3.08	1.54	23.08	3.08	61.54
Supporting transport	0.0032	72.92	6.25	15.63	5.21	33.33	17.71	21.88
Sewage/refuse	0.0007	68.00	6.67	5.33	20.00	29.33	17.33	21.33
Hotels/Restaurants	0.0035	67.00	1.82	25.10	6.07	7.69	22.67	36.64
Fabricated metal products	0.002	63.64	15.07	8.68	12.79	20.55	21.92	21.00
Retail	0.0002	62.77	10.55	13.35	13.28	22.84	15.40	24.58
Other business activities	0.0239	62.41	17.56	12.38	7.76	23.29	10.91	28.10
Construction	0.0246	56.73	11.66	10.60	21.00	23.75	12.09	20.89
Wholesale trade	0.0039	56.59	14.63	14.88	13.66	26.34	11.46	19.02
Manufacture of motor vehicles	0.0017	55.33	15.16	14.34	15.16	15.98	23.77	15.57
<i>Total Sample</i>		<i>56.0</i>	<i>16.8</i>	<i>13.5</i>	<i>13.8</i>	<i>20.8</i>	<i>15.8</i>	<i>19.3</i>

4.7 More and Better Jobs?

The Labour Force Survey indicates that, while the number of jobs in the EU increased from 209.874 million in 2000 to 226.552 million in 2008 (an increase of 7.9%), this increase was largely confined to the service sector. The proportion of service sector jobs rose from 65.9 to 70.4%, while the proportion of jobs in the agricultural sectors declined from 7.3 to 5.6% and, in the industrial sectors, it declined from 26.8 to 24%. However, although more jobs have been created, it is important to establish whether the expansion of the service sector has led to an overall increase in the number of high quality jobs, and whether more high quality jobs have been created by the expansion of the service sector than would have been achieved if job growth had been evenly distributed among the three main sectoral groups. To examine these issues, we calculated the following statistics:

- The number of jobs for each job type in 2000 to 2008. The number of jobs in each sectoral group at each time point (i.e., agriculture, industry and services) was derived from the Labour Force Survey, while the proportions of job types in each sectoral group were derived from our own analysis of the EWCS.
- The total number of new jobs in each job types that were created from 2000 to 2008

and the percentage change in each job type over this period (See rows 1 and 2 in the Totals section in Table 4.14). An assumption made here is that the proportion of job types has remained the same over this time period (there is no data to indicate otherwise) and that any changes in job factors have been evenly distributed amongst the job types and not altered substantially the level of job quality of each job type.

- The number of jobs in each job type in 2008 that would have been created if all sectors had grown at the same rate (7.9%). We then subtracted the actual amount of jobs created from this estimate (see row 3 in the Totals section in Table 4.14).
- The percentage of new jobs gained or lost in each job type since 2000 that is attributable to the shift towards services was calculated, i.e., $(\text{jobs gained or lost since 2000 due to shift towards services} / \text{new jobs since 2000}) * 100$. This figure is shown in row 4 in the Totals section in Table 4.14. This figure also represents the percentage of new jobs that would not have been created if the shift to services had not occurred
- The percentage change since 2000 in the total number of jobs in the job type that is attributable to the shift towards services, i.e., $(\text{total number of jobs in job type in 2000} / \text{new jobs since 2000}) * 100$. This figure is shown in row 4 in the Totals section in Table 4.14. This figure also represents the percentage of the total number of jobs that would not have been created if the shift to services had not occurred

Table 4.14 shows that the increase in jobs from 2000 to 2008 can be estimated to have created 8.19 million high quality jobs and 8.48 million low quality jobs. In particular the percentage increase in each job type was: active jobs (3.17 million, 9.3%), saturated jobs (2.62 million, 8.9%), team-based jobs (2.41 million, 8.3%), passive-independent (3.22 million, 7.5%), high-strain (2.51 million, 7.7%) and insecure (2.75 million, 6.5%). It might be argued that the change in the number of insecure jobs is greatly underestimated, due to the large increase in temporary work in the EU. However, most of the increase in temporary work occurred before 2000, after which the rate of change was much slower (Eurofound, 2007).

Table 4.14: Estimated Growth in Job Types 2000-2008

	Job Types						
	Active	Sat.	Team-Based	Passive	High-Strain	Insecure	Total
Agricultural¹ Sectors	9.6	16.7	10.2	14.3	9.9	39.2	
Jobs in 2000 (million)	1.4708	2.5586	1.5627	2.1909	1.5168	6.0058	15.3208
Jobs in 2008 (million)	1.2179	2.1187	1.2940	1.8142	1.2560	4.9733	12.6869
Industrial Sectors¹	14.9	9.9	14.4	25.0	19.2	16.6	
Jobs in 2000 (million)	8.3807	5.5684	8.0995	14.0616	10.7992	9.3369	56.2462
Jobs in 2008 (million)	8.1014	5.3829	7.8296	13.5931	10.4395	9.0258	54.3724
Service Sectors¹	17.5	15.3	13.9	19.2	14.8	19.3	
Jobs in 2000 (million)	24.2037	21.1609	19.2247	26.5549	20.4694	26.6932	138.3069
Jobs in 2008 (million)	27.9112	24.4024	22.1695	30.6226	23.6049	30.7821	159.4925
Totals							
1. NEW jobs from 2000 to 2008 (million)	3.1689	2.6161	2.4062	3.2225	2.5146	2.7450	16.6779
2. % increase from 2000	9.3	8.9	8.3	7.5	7.7	6.5	7.9
3. No. of jobs gained or lost since 2000 due to shift towards services (million)	0.4695	0.3024	0.1240	-0.1590	-0.7590	-0.5756	.0854
4. % of change in new jobs due to shift towards services	14.81	11.56	5.15	-4.93	-30.18	-20.96	
5. % change in total no. of jobs since 2000 due to shift towards services	1.36	1.09	.43	-.37	-2.31	-1.37	

¹ Figures on this row indicate percentage of job type in that sector

The results of our analysis shown in Table 4.14 indicate that the shift toward services has helped to expand the number of high quality jobs. An extra 895,900 high quality jobs were

gained as a result of the shift to services; jobs that would not have been created if job growth was evenly distributed amongst the three main sectoral groups. This represents 10.93% of all new jobs created over the period 2000-2008, and for each high quality job type, the percentage of new jobs gained as a result of the shift to services is: active jobs (14.81%), of saturated jobs (11.56%) and team based jobs (5.15%). The results also suggest that the shift to services has resulted in an extra .97% of high quality jobs since 2000 (for each job type it is 1.36% of active jobs, 1.09% of saturated jobs, and .43% of team based jobs).

In contrast, our analysis suggests that there are 810,460 fewer low quality jobs as a result of the shift to services. Indeed, without the shift towards services, the proportion of low quality jobs created over the period from 2000-2008 would have been higher by 9.56% (for each low quality job type the proportions are passive-independent, 4.93%, high-strain, 30.18% and insecure jobs, 20.96%) and the total number of low quality jobs would have been higher by .68%.

In summary, these results suggest that while more 'better' jobs have been created from 2000-2008, an equal number of 'not-better' jobs have been created over the same period. Furthermore, the shift towards services has only resulted in an extra 895,900 high quality jobs being created from 2000-2008, which is rather small increase when compared to the total number of high quality jobs in 2008 (100.428 million) and the total number of jobs in 2008 (226.552 million). From a policy perspective this implies that the shift towards service sector cannot be relied upon to increase the proportion of high quality jobs and that active intervention is needed to increase the proportion of high quality jobs. Indeed, based on current evidence, even if all jobs were service jobs, then the proportion of high quality jobs would still be outweighed by low quality jobs.

4.8 Summary

Based on our analysis it can be suggested that there are six types of job in the EU (active jobs, saturated jobs, team-based jobs, passive-independent jobs, high-strain jobs and insecure jobs) and that these job types appear to be distinguishable according to four dimensions, namely a) work organisation; b) a dimension consisting of working time flexibility, pay and skills and development; c) non-standard working hours; and, d) job security. The three job types with a higher than average level of job quality were active, saturated and team-based jobs, and the three job types with a lower than average level of job quality were passive-independent, insecure and high-strain jobs. However, the highest quality job type with the most favourable outcomes was the active job type, and the lowest quality job type with the least favourable outcomes was the high-strain job type. Saturated jobs were of a relatively high quality and have favourable outcomes in terms of job satisfaction, but appeared somewhat problematic with regard to physical and psychological well-being. In contrast, passive-independent jobs were of a low job quality, were problematic with regard to employee job satisfaction but less problematic with regard to physical and psychological well-being.

Job types were not evenly distributed throughout the working population. High quality job types were more prevalent at higher occupational levels and amongst employees with higher educational qualifications, while women were slightly more likely than men to have active, team-based, passive and insecure jobs and men were slightly more likely to have saturated and high-strain jobs. With regard to differences between the growing sectors, the high quality sectors have a higher proportion of active jobs and a lower proportion of insecure jobs, while the low quality growing sectors have a higher proportion of insecure jobs. The declining low quality sectors tended to have lower proportions of active jobs and team-based jobs, and a higher proportion of high-strain jobs.

Nor were job types were evenly distributed throughout the EU economy. Growing high quality sectors had a higher proportion of active jobs and a lower proportion of insecure jobs, and the growing low quality sectors were characterised by higher proportions of passive-independent and insecure jobs. The low quality declining sectors were characterised by higher proportions of high-strain jobs. With regard to country differences, Social Democratic countries had the highest proportion of high quality job types. Continental and Liberal countries had the second highest proportion of high quality jobs, although important differences between them were that Continental counties had a higher proportion of active jobs and passive-independent jobs, whereas in Liberal countries had higher proportion of insecure jobs. Southern-European countries and Eastern-European countries had the lowest proportion of high quality jobs and the highest proportions of low quality jobs. In particular, Southern European counties had high proportions of passive-independent jobs and insecure jobs, while Eastern European countries had high proportions of high-strain jobs and insecure jobs.

5 Conclusion

Since 2000 the European Employment Strategy has sought to promote the development of more and better jobs. The growth in the number of jobs, the expansion of service sector jobs and the contraction of jobs in manufacturing and agriculture has been well documented. Perhaps less well documented is whether these jobs are of a better quality. This report goes some way to addressing this issue by providing insight into the quality of jobs in growing and declining sectors of the EU economy, a key finding of which is that economic sectors fall into one of four groups:

- | | |
|--|--|
| — Growing sectors with higher than average job quality | Financial intermediation, Business, Public administration, Education, Health and social work |
| — Growing sectors with lower than average job quality | Retail, Construction, Hotels and restaurants, Other services, Private households |
| — Declining sectors with higher than average job quality | Energy |
| — Declining sectors with lower than average job quality | Manufacturing, Agriculture, Transport |

Another important finding of this report is that there are six key job types in the EU: active jobs, saturated jobs, team-based jobs, passive-independent jobs, high-strain jobs and insecure jobs. These job types differ in terms of job quality and outcomes. For example, active jobs have the highest levels of job quality and are associated with the highest levels of employee well-being, while high-strain jobs have the lowest job quality and are associated with the lowest levels of employee well-being. An clear implication of these differences between job types is that policies should be geared towards the promotion of high quality job types, especially active jobs and team-based jobs. It might also be suggested that the promotion of saturated jobs should also be a policy, as these jobs have a high level of job quality and were associated with high levels of job satisfaction. But such jobs are problematic in terms of physical and psychological well-being. As such, it might be better to concentrate on devising strategies to change saturated jobs into active jobs. Policies could also be geared to improving the quality of low quality jobs types, although the strategies to do this will depend on the job type. For example, high-strain jobs would benefit from policies that sought to increase job resources, such as job autonomy and team autonomy, and more flexible working hours, whereas passive jobs would benefit from policies that aimed to increase job resources and job demands.

The analysis of job quality and job types in growing and declining sectors indicates that, while the decline in manufacturing sectors has led to a loss of low quality jobs, such as high-strain jobs, the expansion of the service sector has led to increases in high quality jobs (e.g., active jobs) and low quality jobs, such as passive-independent and insecure jobs. But the shift to service sector employment has only brought about a very small increase in the overall proportion of high quality jobs, with increases in high quality jobs being offset by increases in low quality jobs. This implies that the shift towards service

sector employment cannot be relied upon to increase the proportion of high quality jobs, an aim that may require more active intervention and regulation. Indeed, active intervention in employment and labour market policies is a characteristic of the Social Democratic countries that had the highest proportion of high quality jobs. As such, the institutional and regulatory frameworks of these countries could be used as a model on which to base policy initiatives. However, the institutional and regulatory frameworks in Social Democratic countries were developed within the context of a strong organised labour movement, which may not be present in countries with different institutional regimes. Policies to improve job quality therefore need to be sensitive to these institutional and historical differences. Furthermore, our analysis suggests that the job quality in Social Democratic countries is not without problems either. In particular, the level of saturated and high-strain jobs was comparatively high in some Social Democratic countries, which suggests that the creation of jobs of this type is a potential risk in Social Democratic institutional regimes.

Policies targeted to specific types of institutional regime must be sensitive to the types of job that exist within them. For example, Social Democratic countries have a high proportion of saturated and high-strain jobs, Continental countries have a high proportion of passive-independent jobs, Liberal countries have high proportion of insecure jobs, while Southern European countries have high proportions of passive-independent jobs and insecure jobs, and Eastern European countries have high proportions of high-strain jobs and insecure jobs. Policy interventions need to reflect these differences, as the type of policy needed to reduce the level of high-strain jobs might be very different to the type of policy needed to reduce insecure jobs

Finally, the expansion of the EU economy may be having an unequal impact on women in comparison to men, not only economically but also in terms of women's psychological and physical well-being at work. This is because women appear to be at greater risk of working in low quality passive-independent and insecure jobs and of working in low quality growing sectors, and appear to have greater difficulties with regard to progressing in, or re-entering, high quality growing sectors. Furthermore, partly as a result of working in low quality sectors, women appear to be more at risk of having part-time contracts or non-permanent contracts. Clearly, policies are needed to address these issues.

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Appendices

Appendix A: Job Quality Classifications

Tangian 2007

1. *Qualification and development possibilities*
 - (a) Training opportunities
 - (b) Training-requiring working conditions
 2. *Creativity (possibilities to develop own ideas)*
 3. *Career chances (in the enterprise)*
 4. *Possibilities for influence and initiative*
 - (a) Own planning and arranging work
 - (b) Influence on the amount/quality of work
 - (c) Influence on the working time arrangements
 5. *Communication and transparency*
 - (a) Availability of necessary information
 - (b) Clear formulation of tasks and requirements
 6. *Quality of management/leadership*
 - (a) Appreciation and attention of the boss
 - (b) Good planning of work by the boss
 - (c) Appreciation of training by superiors
 7. *Industrial culture*
 - (a) Support of cooperative work
 - (b) Competent/appropriate management
 8. *Collegiality (possibility to get assistance from colleagues)*
 9. *Meaningfulness of work (social usefulness)*
 10. *Working time arrangements*
 - (a) Own adjustments of overwork
 - (b) Reliable (advanced) planning of working time
 - (c) Consideration of individual needs while planning the working time
 - (d) General working time issues
 11. *Intensity/exhaustiveness of work*
 - (a) Hectic and tight deadlines
 - (b) Insufficiency of time for a high quality work
-

12. *Physical strains*

- (a) Heavy physical work
- (b) Physically one-sided work
- (c) Noise and other disturbing /unhealthy factors
- (d) Health and safety

13. *Emotional strains*

- (a) Restraining/suppressing own emotions
- (b) Discrimination/violence

14. *Job stability and job security (Fear of the uncertain future)*

15. *Income*

- (a) Fair performance/income ratio
- (b) Sufficient income

Laeken Job Quality Indicators (Employment in Europe Report, 2008)

1. *Intrinsic job quality*

- (a) Transitions between non-employment and employment and, within employment, by pay level
- (b) Transitions between non-employment and employment and, within employment, by type of contract
- (c) Satisfaction with type of work in present job

2. *Lifelong learning and career development*

- (a) Percentage of the working age population participating in education and training by gender, age group, employment status and education level
- (b) Percentage of the labour force using computers in work, with or without specific training

3. *Gender equality Ratio of women's gross hourly earnings to men's for paid employees at work*

- (a) Employment rate gap between men and women
- (b) Unemployment rate gap between men and women
- (c) Gender segregation in occupations
- (d) Gender segregation in sectors

4. *Health and safety at work*

- (a) The evolution of the incidence rate

5. *Flexibility and security*

- (a) Number of employees working part-time and with fixed-term contracts as a percentage of the total number of employees

6. Inclusion and access to the labour market

- (a) Transitions between employment, unemployment and inactivity
- (b) Transitions between non-employment and employment or training
- (c) Total employment rate, and by age group and education level
- (d) Total long-term unemployment rate, and by gender
- (e) Percentage of early school-leavers
- (f) Youth unemployment ratio

7. Work organisation and the work–life balance

- (a) Difference in employment rates for individuals aged 20 to 50 in households having or not a child aged between 0 and 6 years
- (b) Children cared for (other than by the family) as a proportion of all children in the same age group
- (c) Employees who left over the last year their job for family duties and intend to go back to work but are currently unavailable for work

8. Social dialogue and workers' involvement

- (a) No agreement

9. Diversity and non-discrimination

- (a) Employment rate gap for workers aged between 55 to 64 years old
- (b) Employment and unemployment rate gaps for ethnic minorities and immigrants

10. Overall economic performance and productivity

- (a) Growth in labour productivity (both per hour worked and per person employed)
- (b) Total output (both per hour worked and per person employed)
- (c) Percentage of the population having achieved at least upper secondary education by gender, age group and employment status

Appendix B: Dimensions of Job Quality by Sub-Sector using Weighted Means

Table A.1: Dimensions of Job Quality by Sub-Sector using Weighted Means

NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
45	Construction	0.0246	52.09	45.50	55.29	63.50	30.36	62.69	45.84	42.23
74	Other business activities	0.0239	58.26	57.94	57.49	68.34	29.11	63.14	47.55	44.23
85	Health and social work	0.0132	59.01	54.65	55.93	69.79	29.66	56.36	50.55	53.28
72	Computer and related activities	0.0051	68.86	60.82	59.10	86.46	31.41	65.28	51.19	55.33
80	Education	0.0045	61.68	57.30	57.14	70.15	31.48	64.37	55.05	49.54
51	Wholesale trade and commission trade, except of motor vehicles	0.0039	57.31	53.95	56.78	66.65	30.91	62.10	46.14	49.16
95	Activities of households as employers of domestic staff	0.0036	41.89	52.22	47.04	27.64	26.97	73.82	49.41	25.32
55	Hotels and restaurants	0.0035	48.83	47.81	53.01	54.01	28.81	48.89	44.91	41.05
63	Supporting and auxiliary transport activities	0.0032	53.19	53.23	52.43	54.58	31.43	57.57	49.02	40.63
70	Real estate activities	0.003	58.01	58.92	56.28	67.26	29.91	66.45	46.31	31.62
92	Recreational, cultural and sporting activities	0.0028	58.37	54.97	56.70	73.16	28.57	53.95	49.30	46.35

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NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
28	Manufacture of fabricated metal products	0.002	48.57	46.90	54.47	46.63	30.80	58.39	46.93	40.15
34	Manufacture of motor vehicles, trailers and semi-trailers	0.0017	51.89	51.10	52.32	53.36	30.93	60.92	42.42	44.81
67	Activities auxiliary to financial intermediation	0.0016	65.78	61.98	58.16	82.97	31.06	70.94	48.93	48.61
75	Public administration and defence, etc.	0.0016	62.27	57.03	57.48	72.14	30.90	62.44	55.16	53.61
93	Other service activities	0.0013	53.30	54.05	53.59	59.53	29.20	63.10	48.55	36.54
91	Activities of membership organisations n.e.c.	0.0011	63.13	58.26	65.36	72.36	30.62	66.85	50.99	59.99
33	Manufacture of medical, precision and optical instruments	0.0007	52.76	55.99	56.30	47.84	31.40	62.49	39.26	51.13
50	Sale, maintenance and repair of motor vehicles and motorcycles	0.0007	54.19	48.64	52.58	67.29	30.01	64.17	45.98	39.85
90	Sewage and refuse disposal, sanitation and similar activities	0.0007	49.25	49.06	52.47	49.47	29.44	62.84	50.67	26.02
71	Renting of machinery and equipment without operator	0.0005	57.19	56.53	52.29	71.62	27.99	62.84	44.81	28.79

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NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
37	Recycling	0.0004	59.55	54.37	59.90	71.18	29.71	65.28	46.32	76.04
65	Financial intermediation, except insurance and pension funding	0.0004	68.24	62.10	58.37	85.70	31.23	70.30	51.67	61.24
52	Retail trade, except of motor vehicles and motorcycles, etc.	0.0002	52.29	54.36	54.80	55.97	28.18	59.77	46.54	42.66
73	Research and development	0.0002	62.44	60.41	58.15	74.56	32.24	65.04	48.24	51.78
25	Manufacture of rubber and plastic products	0.0001	47.80	47.54	48.17	47.79	28.77	53.32	46.98	38.28
99	Extra-territorial organisations and bodies	0.0000	56.40	59.38	56.77	62.69	27.83	69.21	53.05	16.10
41	Collection, purification and distribution of water	-0.0001	58.58	50.87	58.96	70.66	31.17	56.34	51.48	51.55
31	Manufacture of electrical machinery and apparatus n.e.c.	-0.0002	51.82	48.23	53.28	57.03	30.37	62.98	47.53	52.08
14	Other mining and quarrying	-0.0003	53.92	50.87	58.60	62.37	29.57	54.20	54.58	25.54
12	Mining of uranium and thorium ores	-0.0004	63.08	69.66	39.04	100.00	20.74	72.04	34.88	0.00
5	Fishing, fish farming and related service activities	-0.0006	34.21	42.25	47.30	13.99	31.13	48.34	41.21	17.61

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NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
13	Mining of metal ores	-0.0006	46.60	37.60	58.72	42.21	30.22	40.02	43.13	74.43
16	Manufacture of tobacco products	-0.0006	74.28	59.67	64.39	95.23	34.84	74.05	45.15	98.43
61	Water transport	-0.0006	56.96	50.81	61.25	63.40	34.59	54.37	50.34	52.42
23	Manufacture of coke, refined petroleum products and nuclear	-0.0007	50.36	52.33	42.86	40.69	32.67	53.56	59.35	47.21
35	Manufacture of other transport equipment	-0.0007	56.85	50.05	54.65	72.88	29.09	56.74	48.51	48.60
2	Forestry, logging and related service activities	-0.0008	48.34	48.46	58.27	42.71	28.32	67.39	45.78	46.60
26	Manufacture of other non-metallic mineral products	-0.001	51.30	46.02	51.24	61.35	30.47	55.27	40.36	44.92
62	Air transport	-0.001	63.14	56.26	57.69	80.05	31.85	47.20	51.22	50.58
11	Extraction of crude petroleum and natural gas; service activities	-0.0011	37.88	46.54	43.34	34.19	25.83	59.09	39.09	16.65
20	Manufacture of wood and of products of wood and cork	-0.0012	49.49	45.05	50.39	54.93	29.36	61.04	46.09	48.37
30	Manufacture of office machinery and computers	-0.0012	54.72	54.56	52.06	57.57	27.42	64.11	46.88	50.26

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NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
21	Manufacture of pulp, paper and paper products	-0.0018	52.43	49.86	50.92	62.48	30.26	57.37	42.72	33.33
22	Publishing, printing and reproduction of recorded media	-0.0018	56.08	51.06	58.07	69.64	30.40	62.49	43.68	36.67
24	Manufacture of chemicals and chemical products	-0.0018	58.09	53.26	57.18	69.94	30.64	62.13	44.75	47.14
10	Mining of coal and lignite; extraction of peat	-0.0019	39.62	44.14	47.15	27.00	30.19	50.34	43.59	26.62
32	Manufacture of radio, television and communication equipment	-0.002	57.56	56.75	56.83	71.66	29.04	59.44	45.10	27.55
60	Land transport; transport via pipelines	-0.002	48.74	51.27	54.44	46.79	29.28	49.18	44.48	48.24
36	Manufacture of furniture; manufacturing n.e.c.	-0.0022	50.38	47.40	58.02	56.88	28.78	62.56	44.84	34.74
66	Insurance and pension funding, except compulsory social security, etc,	-0.0023	67.74	60.58	59.75	86.64	31.41	69.68	49.42	63.46
29	Manufacture of machinery and equipment n.e.c.	-0.0026	54.07	52.65	56.31	55.81	31.22	60.83	48.81	40.70
40	Electricity, gas, steam and hot water supply	-0.0027	61.44	52.37	57.15	78.87	31.66	63.90	49.74	49.55

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NACE No.	Sub-Sector	GROWTH	Job Quality Weighted Mean	Job Demands	Job Resources	Skills and Development	Payment System	Flexibility	Security	Engagement
19	Tanning and dressing of leather; manufacture of luggage, handbags, etc.	-0.0034	51.99	53.08	50.75	67.09	29.26	67.29	29.13	30.94
27	Manufacture of basic metals	-0.0034	47.67	43.96	48.9	51.58	30.37	62.16	44.27	34.24
64	Post and telecommunications	-0.0035	56.14	53.81	51.27	60.22	32.08	62.63	48.37	50.79
17	Manufacture of textiles	-0.0053	40.97	51.16	51.34	29.29	27.30	65.25	38.51	25.82
18	Manufacture of wearing apparel; dressing and dyeing of fur, etc.	-0.0058	45.64	46.87	47.91	46.53	28.28	61.18	43.19	30.78
15	Manufacture of food products and beverages	-0.0097	47.84	46.08	50.28	50.41	29.26	56.79	45.41	37.73
1	Agriculture, hunting and related service activities	-0.0332	40.84	44.74	55.15	37.00	27.69	54.09	52.41	34.20
96	Undifferentiated goods producing activities of private houses		40.01	55.34	48.08	27.69	28.03	66.32	40.72	24.59
97	Undifferentiated services producing activities of private houses		43.10	61.90	51.72	15.96	28.69	66.44	43.94	28.66
	Total		54.82	52.70	55.16	61.90	29.87	60.52	48.35	45.12

Appendix C: Job Type by Sub-Sector Ranked by Growth

Table A.2: Job Type by Sub-Sector Ranked by Growth

	Growth	High Quality Jobs	Low Quality Jobs	High Quality Jobs			Low Quality Jobs		
				Active	Saturated	Team-Based	Passive	High-Strain	Insecure
Construction	0.0246	43.27	56.73	11.66	10.60	21.00	23.75	12.09	20.89
Other business activities	0.0239	37.59	62.41	17.56	12.38	7.76	23.29	10.91	28.10
Health and social work	0.0132	50.31	49.69	15.63	21.83	12.85	10.87	21.02	17.79
Computer and related activities	0.0051	70.81	29.19	27.95	36.02	6.83	21.12	3.73	4.35
Education	0.0045	46.61	53.39	13.81	10.69	22.11	23.78	10.93	18.68
Wholesale trade and commission trade, except of motor vehicles	0.0039	43.41	56.59	14.63	14.88	13.66	26.34	11.46	19.02
Activities of households as employers of domestic staff	0.0036	12.31	87.69	7.69	3.08	1.54	23.08	3.08	61.54
Hotels and restaurants	0.0035	33.00	67.00	1.82	25.10	6.07	7.69	22.67	36.64
Supporting and auxiliary transport activities; activities of travel agencies	0.0032	27.08	72.92	6.25	15.63	5.21	33.33	17.71	21.88
Real estate activities	0.003	51.55	48.45	29.90	8.25	13.40	29.90	8.25	10.31
Recreational, cultural and sporting activities	0.0028	46.24	53.76	8.09	30.64	7.51	8.09	17.34	28.32
Manufacture of fabricated metal products, except machinery and equipment	0.002	36.36	63.64	15.07	8.68	12.79	20.55	21.92	21.00
Manufacture of motor vehicles, trailers and semi-trailers	0.0017	44.67	55.33	15.16	14.34	15.16	15.98	23.77	15.57
Public administration and defence; compulsory social security	0.0016	53.03	46.97	28.06	11.04	13.94	13.86	16.94	16.17

Activities auxiliary to financial intermediation	0.0016	56.34	43.66	33.80	4.23	18.31	15.49	5.63	22.54
Other service activities	0.0013	47.94	52.06	23.69	9.22	15.04	17.73	15.04	19.29
Activities of membership organisations n.e.c.	0.0011	53.76	46.24	16.48	23.08	14.29	20.88	0.00	25.27
Sewage and refuse disposal, sanitation and similar activities	0.0007	32.00	68.00	6.67	5.33	20.00	29.33	17.33	21.33
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	0.0007	49.04	50.96	17.20	7.32	24.52	31.21	7.01	12.74
Manufacture of medical, precision and optical instruments, watches and clocks	0.0007	53.33	46.67	13.33	13.33	26.67	20.00	23.33	3.33
Renting of machinery and equipment without operator and of personal and household goods	0.0005	48.28	51.72	26.67	0.00	20.00	0.00	13.33	40.00
Financial intermediation, except insurance and pension funding	0.0004	59.55	40.45	32.21	9.74	17.98	25.09	4.87	10.11
Recycling	0.0004	66.67	33.33	15.38	46.15	7.69	15.38	0.00	15.38
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	0.0002	37.23	62.77	10.55	13.35	13.28	22.84	15.40	24.58
Research and development	0.0002	86.23	13.77	42.45	35.25	7.91	3.60	1.44	9.35
Manufacture of rubber and plastic products	0.0001	40.57	59.43	16.98	13.21	10.38	7.55	28.30	23.58
Collection, purification and distribution of water	-0.0001	56.72	43.28	19.40	26.87	10.45	5.97	28.36	8.96
Manufacture of electrical machinery and apparatus n.e.c.	-0.0002	37.89	62.11	12.58	4.40	20.75	35.85	5.03	21.38
Other mining and quarrying	-0.0003	39.29	60.71	17.24	20.69	0.00	31.03	20.69	10.34

Fishing, fish farming and related service activities	-0.0006	10.53	89.47	10.00	0.00	5.00	25.00	35.00	25.00
Mining of metal ores	-0.0006	16.67	83.33		14.29		14.29	57.14	14.29
Water transport	-0.0006	34.38	65.63	15.63	12.50	9.38	28.13	21.88	12.50
Manufacture of tobacco products	-0.0006	36.36	63.64	30.00	0.00	0.00	70.00	0.00	0.00
Manufacture of coke, refined petroleum products and nuclear fuel	-0.0007	39.53	60.47	30.23	6.98	2.33	2.33	58.14	0.00
Manufacture of other transport equipment	-0.0007	46.34	53.66	17.50	22.50	7.50	2.50	37.50	12.50
Forestry, logging and related service activities	-0.0008	32.00	68.00	10.00	16.00	8.00	4.00	10.00	52.00
Manufacture of other non-metallic mineral products	-0.001	23.81	76.19	3.17	11.11	9.52	17.46	36.51	22.22
Air transport	-0.001	41.77	58.23	7.59	24.05	11.39	10.13	36.71	10.13
Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction	-0.0011	56.25	43.75	12.50	0.00	43.75	18.75	25.00	0.00
Manufacture of wood and of products of wood and cork	-0.0012	20.83	79.17	8.33	4.17	8.33	34.72	19.44	25.00
Manufacture of office machinery and computers	-0.0012	23.81	76.19	5.00	20.00	0.00	20.00	55.00	0.00
Manufacture of pulp, paper and paper products	-0.0018	30.77	69.23	20.51	7.69	2.56	26.92	34.62	7.69
Publishing, printing and reproduction of recorded media	-0.0018	44.59	55.41	15.92	17.83	10.83	24.20	21.66	9.55
Manufacture of chemicals and chemical products	-0.0018	50.70	49.30	34.97	6.99	8.39	13.99	20.98	14.69
Mining of coal and lignite; extraction of peat	-0.0019	13.89	86.11	0.00	5.26	10.53	18.42	55.26	10.53

Land transport; transport via pipelines	-0.002	38.10	61.90	12.46	18.40	7.42	15.73	33.53	12.46
Manufacture of radio, television and communication equipment	-0.002	64.29	35.71	22.22	27.78	14.81	1.85	18.52	14.81
Manufacture of furniture; manufacturing n.e.c.	-0.0022	43.86	56.14	27.49	3.51	12.87	19.88	12.28	23.98
Insurance and pension funding, except compulsory social security	-0.0023	78.53	21.47	51.31	16.23	10.99	12.04	3.66	5.76
Manufacture of machinery and equipment n.e.c.	-0.0026	43.70	56.30	19.66	11.52	12.36	25.00	20.79	10.67
Electricity, gas, steam and hot water supply	-0.0027	44.61	55.39	23.53	4.90	16.18	24.02	14.22	17.16
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	-0.0034	12.12	87.88	9.09	0.00	3.03	66.67	3.03	18.18
Manufacture of basic metals	-0.0034	25.64	74.36	6.45	5.16	13.55	54.84	14.84	5.16
Post and telecommunications	-0.0035	44.01	55.99	12.30	18.77	12.94	28.80	9.06	18.12
Manufacture of textiles	-0.0053	21.65	78.35	4.08	3.06	14.29	45.92	6.12	26.53
Manufacture of wearing apparel; dressing and dyeing of fur	-0.0058	25.15	74.85	6.75	1.84	16.56	38.04	17.79	19.02
Manufacture of food products and beverages	-0.0097	31.22	68.78	10.43	10.43	10.43	28.75	25.95	13.99
Agriculture, hunting and related service activities	-0.0332	38.39	61.61	9.09	18.18	11.00	15.79	7.66	38.28
Undifferentiated services producing activities of private houses		16.00	84.00	8.00	8.00	0.00	40.00	0.00	44.00
Undifferentiated goods producing activities of private houses		23.81	76.19	23.81	0.00	0.00	0.00	0.00	76.19
Extra-territorial organisations and bodies		33.33	66.67	20.00	20.00	0.00	40.00	0.00	20.00
Total		44.04	55.96	16.67	13.54	13.84	20.68	15.89	19.38