European Foundation for the Improvement of Living and Working Conditions

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Contents

Introduction

Starting in 1990, the European Foundation for the Improvement of Living and Working Conditions has carried out a questionnaire-based survey every five years on working conditions throughout the European Union, covering all Member States. Surveys were carried out in 1990 and in 1995, and most recently in 2000. The questionnaire addresses issues relating to the physical, organisational and social work environments, as well as the impact of work on health. Although new questions have been added to the EF2000 survey, a number of questions remained the same (core questionnaire) so as to enable the building of time series. The survey's aim is to provide an overall picture of the situation and the trends in working conditions in the EU. The Foundation has asked TNO Work & Employment to perform a secondary analysis on these surveys with the aim of:

1. Identifying sector profiles with regard to working conditions. The most recent Third European Survey (EF2000) allows for a breakdown at NACE 2-digit level, thus enabling a reasonably detailed sector analysis at EU level. For some sectors, groupings will have to be made.
2. Presenting the development of working conditions within and amongst sectors, using the previous Foundation surveys, which can be performed at branch or sector level (1 digit).
3. Comparing the survey results at sector level with other data sources (for example, national surveys, labour force surveys, etc.).

In this report we will first look at the methodology used. We will then present the results and discuss the findings in view of the information already available in the literature.

Methods 1

Working conditions and health outcomes based on the Third European Survey

The working conditions as measured in the Third European Survey are:

- Physical environment
  - Ambient factors (noise, vibrations, temperature, light, air quality, chemicals)
  - Ergonomics (loads, positions, repetitive movements)
  - Technology (computer use)
  - Place of work (work at home)
  - Telework
  - Contacts with clients

- Time
  - Duration of work
  - Time patterns

- Organisational environment
  - Job demands
  - Job control
  - Skills
  - Task flexibility

- Social environment
  - Support
  - Discrimination/harassment

For those working conditions that are indicated by several variables, scales will be constructed. Scales, when homogenous enough, generally provide a good summary of the concept as measured by the items included, and are much more reliable than single items, measuring the related concept. Particularly within the 'organisational domain', psychosocial stress risks will be constructed according to the prevailing theoretical model of Karasek and Theorell (1990).

Factor analyses and reliability analyses were performed to define scales in order to increase reliability and to reduce the information on working conditions to a scientifically reliable minimum. In Appendix 1 the psychometric information on the scales is presented. It can be concluded that for the year 2000 reasonably reliable scales could be defined.

Health outcomes are presented in this report to a limited extent. Their presentation in relation to sector is restricted to work-related musculoskeletal problems, consisting of back, neck, upper limb problems (the latter are also known as repetitive strain injuries, or RSI) and lower limb problems, as well as work-related stress problems. We will only discuss the health outcomes when presenting the survey data from 2000, because the questions relating to musculoskeletal problems have changed from 1995 to 2000. For the health outcomes the scales used in this report are discussed in Dhondt, Kraan and Van Sloten (2001).

Data sources

In 1995 (as well as in 1990) the sample size of every Member State was set at n = 1000 randomly selected employees (except for Luxembourg, n = 500; both in former East and West Germany separate samples of n = 1000 were drawn). In 2000, the sample size was increased to n = 1500 per Member State (n = 750 for Luxembourg; only one total sample of n = 1500 was drawn for Germany). In 2000, the variable 'NACE' contained 26 different sectors, which was reduced to a set of 18 sectors (see Table 1). This reduction in sectors was justified because a minimal sample size per sector was, for methodological reasons, set at 100 employees per sector.

Table 1 Overview of sectors used for sector profiles in 2000 (18 out of 26)

18 Sectors	Q5r	n=	%
Agriculture	=	824	3,8
Food industry	=	478	2,2
Textiles	=	413	1,9
Chemicals	=	560	2,6
Metals	=	848	3,9
Electrical	=	301	1,4
Miscellaneous manufacturing	mining/quarrying		
	wood/paper		
	transport equipment		
	furniture/recycling	1075	5,0
Public utilities	=	187	0,9
Construction	=	1507	7,0
Wholesale/retail	=	3759	17,4
Catering, hotels and rest.	=	1021	4,7
Transport	land transport		
	water/air	1021	4,7
Post and telecommunications	=	433	2,0
Finance	=	748	3,5
Real estate	=	1464	6,8
Public sector	=	1475	6,8
Education	=	1515	7,0
Health and social	health and social		
	other community		
	private households	3966	18,4
Total		21577	100

Table 1 shows that in Europe two sectors are relatively large — health and social sectors, and wholesale/retail. The health and social sectors are particularly heterogenous, including different types of healthcare institutions (hospitals, nursing homes, psychiatric and geriatric care centres, etc.) as well as all kinds of social work ranging from public nurseries to home care, social work in the neighbourhood, and social activities directed at specific target groups. Wholesale/retail is also fairly heterogenous, and includes both relatively small shops and large warehouses, as well as the wholesale trade, which takes in and distributes cargo.

The public utilities, textiles, and post and telecommunications sectors are relatively small. The manufacturing subsectors are not very large when taken on their own, whereas manufacturing as a whole is considerable (17%, see Table 2). The rest of the sectors are not that large, and contribute from 3.5% (finance) to less than 10% of the working population of the European Union.

For the trend analysis, i.e. the comparison of results between 1995 and 2000, it is possible to distinguish 11 sectors (see Table 2). The results of 1990 cannot be used for trend analysis because of a completely different categorisation of sectors.

Table 2 Comparison of sectors between 1995 and 2000 (11 out of 18)

11 Sectors	18 Sectors	n=	%
Agriculture	Agriculture	824	3.8
Manufacturing	Food industry	3675	17.0
	Textiles		
	Chemicals		
	Metals		
	Electrical		
	Miscellaneous manufacturing		
Public utilities	Public utilities	187	0,9
Construction	Construction	1507	7,0
Wholesale/retail	Wholesale/retail	3759	17,4
Catering, hotels and rest.	Catering, hotels and rest.	1021	4,7
Transport	Transport	1454	6,7
	Post and telecommunications		
Finance	Finance	748	3,5
Real estate	Real estate	1464	6,8
Public sector	Public sector 1457	6,8	
Social sector	Education	5481	25,4
	Health and social sector		
Total		21577	100

Although the main goal of the study is to present sector profiles on the basis of the Foundation survey data, particularly the data collected in 2000, comparisons of the Foundation data with data from other national surveys on sector rankings are highly relevant. In order to be able to make these comparisons, TNO Work & Employment has used comparable information regarding five European countries from the European Agency (European Agency for Safety and Health at Work, 2000).

Analytical framework

The sector profiles will make it possible to identify risk groups in specific sets of working conditions. Reference will be the total sample of the EU. Risk groups will be identified at the NACE 2-digit level, although groupings may be necessary (see Appendix 2). Risk groups are defined as those groups that have at least an intermediate or large difference in an unfavourable direction on one or more working conditions (scales; significant effects, D-values; Cohen, 1988) as measured with the EF2000 survey.

Trends in time across sectors will be calculated in a sample that includes only those countries that participated in both surveys and had enough employees in each year (minimum of 100 per sector) to avoid differences in trends due to lack of reliability on the working conditions score.

Statistical differences will be tested using MANOVAs (including repeated measurements). Because the total sample for the first two measurements was less than in 2000, more grouping was necessary for the ultimate trend analyses.

In Appendix 3 some information will be presented on the statistical techniques used in this study, such as the MANOVA, as well as on presenting information on reliability (Cronbach Alpha).

Methodology and analysis

Working conditions by sector in 2000

The following methodology for the analysis of the 2000 data has been used:

- Step 1: analysis of the quality of the data for several countries, and scale construction for the measurement of working condition concepts. The main concepts will be constructed by means of factor analysis and reliability analyses (Cronbach Alphas, and r_{it}-values; see Appendix 3) in order to obtain usable and methodologically sound constructs on working conditions.
- Step 2: in order to present sector profiles, the scales and the non-scalable working conditions items are transformed into Z-scores (resulting in the same mean and standard deviation: mean = 0, sd = 1; see also Appendix 3). Sectors were profiled against the 'overall result' (= zero) with the exclusion of that specific sector itself. Risk groups at sector level will be identified as those that have risk factor (cluster) scores that are significantly unfavourable or favourable on a specific set of working conditions. When possible, sectors will be identified at NACE 2-digit level, but when necessary groupings will be made.

Trends in working conditions by sector

The following analysis steps will also be performed:

- Step 3: an analysis on comparability of data: the trends will be limited to those countries that participated in the EF1995 survey, and to those working conditions and health outcomes that have been questioned in the same way in both the EF1995 and EF2000 surveys.
- Step 4: trends and changes in working conditions by sector will be identified at the NACE 2-digit level as far as the survey methodology allows it. For the trend analyses, scale scores (and not Z-scores) will be used.

Results 2

In this chapter the sector profiles on working conditions are presented, as well as the trends across the period 1995-2000. First, however, we will briefly present the results from the characterisation of the sectors by gender, age and job status.

Characterisation of the sectors

The tables that form the basis for the characterisation of the sectors by gender, age and job status are presented in Appendix 4. Here we will concentrate on providing a concise summary of these characterisations.

Whereas most sectors have between 35% and 65% female workers, there are some that have a much lower or higher percentage than that. These sectors can be characterised as 'male' or 'female' sectors, respectively. Some sectors are borderline, such as agriculture and post and telecommunications, with 32% and 36% female workers, respectively. Manufacturing (with the exception of textiles), building and construction, and transport are typical 'male' sectors. The building and construction sector is the most extreme, with only 8% female workers.

With regard to age, agriculture is a relatively 'old' sector, with 48% of workers aged between 45 and 64 years and 5% of workers aged 65 years or older. In the other sectors less than 40% of the workers are in the age range of 45 to 64 years, and in the total sample not more than 1.5% of the workers are 65 years or older. The percentage of workers aged 65 years or older is equal or higher than 1% in wholesale/retail (1.5%), in the social sector (1.1%) and in real estate (1.0%). Catering, hotels and restaurants is an extremely young sector, with 28.2% of workers within the age range of 15 to 25 years, whereas the other sectors have less than 20% of workers in that age range. On average the percentage of workers in this age range is 14%.

With regard to job status, agriculture is again a relatively extreme sector: over 55% of the workers are self-employed without employees, compared to the average percentage of 12%. This average percentage is only superseded or equalled by wholesale/retail (20.8%), real estate (13.6%), catering, hotels and restaurants (12.6%), and the building and construction industry (12.0%). The average percentage of self-employed workers *with* employees is 4.8%. The percentage is much lower in post and telecommunications (0.7%) and the public sector (0.5%). The highest percentages are found in catering, hotels and restaurants (9.7%), agriculture (9.4%), building and construction industry (8.1%) and wholesale/retail (7.7%). On average 83% of workers are employees. The percentages are highest in manufacturing, post and telecommunications, public utilities, the public sector and education.

Sector rankings and profiles by working conditions and health outcomes in 2000

Here we will examine the results both from the perspective of working conditions and the perspective of sector. First we will focus on working conditions, with sectors ranked according to the different working conditions. Table 3 shows the sectors that have significantly favourable or unfavourable scores on a particular working condition. In Appendix 5 an overall view of the results showing significant differences per sector for all working conditions and contextual conditions is presented. Appendix 6 presents graphical presentations taking the perspective of working conditions as the central issue, whereas Appendix 7 takes the perspective of sector.

Table 3 shows that particularly for 'non-standard hours' and 'discrimination', relatively few 'unfavourable' sectors could be identified (only three or four), whereas for 'long working hours' relatively few 'favourable' (and many unfavourable) sectors could be identified. This finding suggests that some risks appear to be rather sector-specific, whereas others are not.

Sectors in which employees score particularly unfavourably on non-standard hours are agriculture, catering, hotels and restaurants, transport and wholesale/retail. Sectors in which employees score particularly unfavourably on 'discrimination' are catering, hotels and restaurants, transport, and both the public and social sectors.

Working long hours, on the other hand, was present in almost all sectors except post and telecommunications, education and the public and social sectors.

Table 3 A summary of sectors with significantly favourable or unfavourable scores on working conditions in comparison to the 'overall result' in the EF2000 survey (non-significant differences are excluded)

Working condition	Unfavourable sector	Favourable sector
Ambient conditions	Agriculture	Wholesale/retail
	Food industry	Catering, hotels and restaurants
	Textiles	Post and telecommunications
	Chemicals	Finance
	Metals	Real estate
	Electrical	Public sector
	Miscellaneous manufacturing	Education
	Public utilities	Social sector
	Building and construction	
	Transport	
Ergonomics	Agriculture	Wholesale/retail
	Food industry	Finance
	Textiles	Real estate
	Metals	Public sector
	Miscellaneous manufacturing	Education
	Building and construction	
	Catering, hotels and restaurants	
	Transport	
Non-standard hours	Agriculture	Textiles
	Catering, hotels and restaurants	Chemicals
	Transport	Metal
	Wholesale/retail	Electrical
		Miscellaneous manufacturing
		Public utilities
		Building and construction
		Post and telecommunications
		Finance
		Real estate
		Public sector
		Education
Long working hours	Agriculture	Post and telecommunications
	Textiles	Public sector
	Chemicals	Education
	Metals	Social sector
	Miscellaneous manufacturing	
	Public utilities	
	Building and construction	
	Wholesale/retail	
	Catering, hotels and restaurants	
	Transport	
	Real estate	

Table 3 (continued)

Working condition	Unfavourable sector	Favourable sector
High job demands	Food industry	Agriculture
	Metals	Wholesale/retail
	Miscellaneous manufacturing	Public sector
	Building and construction	Education
	Catering, hotels and restaurants	Social sector
	Transport	
	Post and telecommunications	
No job control	Food industry	Agriculture
	Textiles	Electrical
	Chemicals	Finance
	Miscellaneous manufacturing	Real estate
	Catering, hotels and restaurants	Public sector
	Transport	Social sector
	Post and telecommunications	
	Education	
Unskilled work	Agriculture	Chemicals
	Food industry	Metals
	Textiles	Miscellaneous manufacturing
	Wholesale/retail	Post and telecommunications
	Catering, hotels and restaurants	Building and construction
	Transport	Finance
		Real estate
No task flexibility	Agriculture	Food industry
	Textiles	Chemicals
	Wholesale/retail	Metals
	Real estate	Electricity
	Transport	Miscellaneous manufacturing
	Education	Post and telecommunications
		Building and construction
		Catering, hotels and restaurants
		Public sector
		Social sector
No social support	Agriculture	Chemicals
	Food industry	Metals
	Building and construction	Electrical
	Wholesale/retail	Miscellaneous manufacturing
	Catering, hotels and restaurants	Public utilities
		Post and telecommunications
		Finance
		Public sector
		Education
		Social sector
Discrimination	Catering, hotels and restaurants	Agriculture
	Transport	Food industry
	Public sector	Textiles
	Social sector	Chemicals
		Metals
		Miscellaneous manufacturing
		Building and construction
		Wholesale/retail
		Finance
		Real estate

Table 4 shows the favourable and unfavourable sectors with regard to health outcomes. The graphical representations of health outcomes by sector are also included in Appendix 6. The testing results are included in Appendix 5.

Table 4 A summary of sectors with significantly favourable or unfavourable scores on health outcomes

Working condition	Unfavourable sector	Favourable sector
Work-related musculoskeletal problems	Agriculture	Finance
	Building and construction	Education
	Transport	Real estate
	Textiles	Wholesale/retail
	Social sector	Public sector
		Chemicals
Work-related stress problems	Transport	Wholesale/retail
	Education	Food industry
	Catering, hotels and restaurants	Real estate
	Public sector	Building and construction
	Social sector	

It can be seen that work-related musculoskeletal problems are highly prevalent in those sectors that have high ergonomic risks, unskilled work, and to a lesser extent lack of social support and high ambient risk. These include agriculture, building and construction, transport, and textiles. The social sector is at the opposite end of the scale, although, despite the fact that the social sector is quite often to be found on the 'favourable' side of the risk dimension, the workers in this sector relatively often report work-related musculoskeletal problems. What really causes the high rate of musculoskeletal problems in this sector is a matter for further discussion. Psychosocial risks of the interactive type are, for example, shown to be causally related to RSI-related problems (Ariëns, 2001). The main risk to be noted in the social sector is the high risk of discrimination at work.

Sectors that have significantly unfavourable levels of work-related stress problems are transport, education, catering, hotels and restaurants, and the public and social sectors. These are characterised by workers having low control in their jobs, and being confronted with discrimination. In some but not all of the sectors with high levels of work-related stress problems, workers have high job demands. Again, workers in the social sector report relatively high levels of work-related stress problems. The fact that these workers are at high risk for discrimination and intimidation may be responsible for this.

In Table 4 sectors are presented according to the amount of significant favourable/positive or unfavourable/negative risks. Since these risks are found to be independent from one another (as tested by factor analysis), this summation provides a good indication of the 'overall working condition risk'. A summation of both favourable working conditions and unfavourable working conditions is presented, as well as the net difference.

Appendix 5 additionally presents information on a number of contextual conditions within sectors: use of computers, telework, work at home, customer contacts and 'second job'. It shows how sectors are characterised by these items. The results are not discussed here.

On the basis of the above analyses of the EF2000 survey data, we can conclude that:

1. Long working hours and high job demands are highly prevalent in a large number of sectors, with agriculture showing the longest working hours, whereas non-standard hours and discrimination are highly prevalent in only a few sectors. Non-standard hours are specific for catering, hotels and restaurants, agriculture, and transport. Unskilled work is specific for catering, hotels and restaurants, wholesale/retail, food industry and transport. Discrimination is specific for catering, hotels and restaurants, transport, and the public and social sectors.
2. Transport and catering, hotels and restaurants are the sectors with the most unfavourable working conditions, whereas the profit services such as finance, and the public and social sectors at the European level show the most positive responses on the working conditions identified in this report. Wholesale/retail has the most balance between favourable and unfavourable working conditions.
3. Sectors with high levels of work-related musculoskeletal problems are those that score relatively unfavourably on ambient and ergonomic risk factors, with the exception of the social sector. Sectors with work-related stress problems are those with low control, high discrimination and sometimes also high job demands.

Table 5 Sectors by risk factors (10 risk factors)

Sector	Significant number of negative risks	Significant number of positive risks	Net balance in risks	Typification of the sector
Agriculture	7	3	–4	High on physical risks + highly unfavourable on working hours
Food industry	5	2	–3	High physical + psychosocial risk
Textiles	7	2	–3	High physical + psychosocial risk
Chemicals	3	7	+4	High on psychosocial risk + highly unfavourable on ambient conditions
Metals	4	5	+1	High physical + psychosocial risk
Electrical	1	6	+5	*Low* physical + psychosocial risk
Misc. manufacturing	5	5	0	High physical + psychosocial risk
Public utilities	2	6	+4	*Low* physical + psychosocial risk + highly unfavourable on ambient conditions
Building and construction	7	2	–5	High physical + psychosocial risk
Wholesale/retail	5	5	0	Positive and negative positions on risks are in balance
Catering, hotels and restaurants	8	2	–6	Number 2 on physical + psychosocial risk; no standard hours
Transport	9	0	–9	No 1 on physical + psychosocial risk
Post and telecommunications	2	4	+2	High on psychosocial risk
Finance	0	7	+7	Number 1/2 on *lack of* physical + psychosocial risk
Real estate	3	6	+3	*Low* on physical risk
Public sector	1	8	+7	Number 1/2 on *lack of* physical + psychosocial risk
Education	2	7	+5	*Low* on physical + psychosocial risk
Social sector	1	6	+5	*Low* on physical + psychosocial risk

Trends in working conditions by sector, 1995-2000

Table 6 shows a summary of the changes in working conditions by sector in the last five years for all working conditions (see also Appendix 8). This illustrates that, in general, the most overall negative changes were in the areas of lack of job control, unskilled work and discrimination. The increase in high job demands mainly took place in the catering, hotels and restaurants, real estate and to a lesser extent wholesale/retail sectors. It should be noted that the increase in unfavourable ergonomic conditions was already a big problem in these sectors. The increase in job demands in catering, hotels and restaurants and wholesale/retail is accompanied by an increase in lack of control and unskilled work. This combination of risks strongly increases the risk for job strain and other negative consequences from work-related stress in these sectors (Karasek and Theorell, 1990).

Unfavourable changes in discrimination can be seen in the 'high risk' sectors of catering, hotels and restaurants, and transport, but also in the 'balanced' sectors of wholesale/retail, public utilities, and the social sector.

Some of the changes have to be looked at while bearing in mind the risks in these sectors. We see that working hours changed for the better in agriculture, but this is one of the specific risks in this sector.

Also looking at changes in several contextual factors, it should be noted that in almost all sectors there was an increase in computer use at the work floor, whereas customer contact decreased in almost all sectors (see Appendices 6, 8 and 9). Computer use particularly increased for real estate, the public sector, and finance. The decrease in customer contact took place mainly, in order of magnitude, in the public sector, real estate, manufacturing, construction, and wholesale/retail.

Table 6 Trends in working conditions, 1995-2000

11 Sectors	More favourable changes	More *unf*avourable changes
Agriculture	Working hours	None
Industry	Working hours and work at weekends	Ergonomic conditions, skills
Public utilities	None	None
Construction	Work at weekends	Ergonomic conditions
Wholesale/retail	Working hours	Ambient conditions, job demands, job control, skills and discrimination
Catering, hotels and restaurants	Working hours	Job demands, job control, skills and discrimination
Transport	Working hours	Job control, skills and discrimination
Finance	Working hours	None
Real estate	Work at weekends	Job demands
Public sector	Work at weekends	Skills
Social sector	Working hours	Job control, skills and discrimination

In Appendices 8 and 9, graphical presentations of changes in working conditions by sector and in the sector profiles are shown.

Comparisons with other national surveys

To corroborate the findings of the EF2000 survey, data from this survey were compared to data from national sources. For Finland, Germany, the United Kingdom, the Netherlands and Spain, sector rankings on 'noise', 'speed', and 'lifting or carrying heavy loads' from national surveys are compared to the sector rankings in the EF2000 survey for these countries. A detailed review of the ranking is presented in Appendix 10. As the number of employees per country tends to be rather small, particularly within the EF data set, we only highlighted a difference in two or more ranking positions per sector. Looking at the rankings in that way, we can conclude that:

1. The sector rankings are not very consistent between the EF2000 survey data and the Spanish national data. There was much more consistency between the EF2000 survey data and the other national surveys;
2. The sector rankings are most consistent for 'noise', and least consistent for 'speed'.
3. Some sectors appear to be particularly inconsistent — the social sector and to some minor extent the public sector.

Conclusion 3

In this report, we presented sector profiles on working conditions using the Third European Foundation (EF2000) Survey, and trends herein across the last five years. For several working conditions reliable scales were computed.

The comparison between the EF2000 survey data and the national surveys was meant to provide some information on the representativeness and validity of the 'random employee samples' within the EF2000 survey, on the assumption that the national surveys are representative and valid. It was found that one of the countries systematically showed rather large inconsistencies in rankings between sectors for the two surveys, whereas the other four countries showed much more consistency between the national data and the EF2000 survey data. This suggests that this assumption may have been less valid for the Spanish national survey than for the other national surveys used in the comparison.

The sector rankings also show that there is some difference in validity (and/or reliability) as to which of the different working conditions are measured. It appears that 'noise' discriminates more reliably and between sectors than 'speed of work' does. The inconsistencies found may, however, also be caused by differences in what the sector codes really consist of. Differences in the 'content' of subsectors in the two surveys may very well create differences in rankings. The social sector and the public sector in particular are very broad, and may be partly responsible for inconsistencies in ranking. These sectors are perhaps not as clearly distinguished with regard to working conditions as manufacturing, agriculture and catering, hotels and restaurants, for example. Particularly for the Netherlands, the feelings and findings are that the social sector, including healthcare, should score high on 'work speed'. This is not only the case in the national survey from the National Bureau of Statistics as used for the comparison between the EF survey data and the national surveys, and also in Appendix 10, but also in other national surveys (Houtman et al, 1999; Van Veldhoven and Broersen, 1999). When the clear identification of sectors is considered important, increasing the data set, for example by aggregating data bases across years, might result in a large enough data base to allow a comparison of subgroups, for example, sectors at a more specific level.

Looking at working conditions according to sector, one can conclude that some of the unfavourable working conditions, such as non-standard hours and discrimination, are highly specific for several sectors. Non-standard hours are common in agriculture, catering, hotels and restaurants, and transport. Discrimination is found in the 'high risk' sectors of catering, hotels and restaurants, and transport, as well as in the public and health and social sectors, sectors for which this is one of the few risk factors.

Other unfavourable working conditions are, however, much more widespread. Compared to the overall result, long working hours are found in almost all sectors, except the larger sectors of post and telecommunications, and the public and social sectors.

Workers in the catering, hotels and restaurants or transport sectors are confronted with the most unfavourable working conditions. Consequently these sectors are confronted with only very few working conditions in a favourable way: more favourable ambient conditions, and above all task flexibility.

Employees working in finance, the public or social sectors, or in real estate are confronted with relatively few unfavourable working conditions. Employees who work in finance do not, on

average, have significantly unfavourable scores on any of the working conditions as measured. For the public and social sectors the only relatively unfavourable scores are for discrimination. Employees in real estate report high job demands, long working hours and no task flexibility.

The changes in working conditions over the last five years show that particularly for the two sectors that are most at risk in 2000 because of their general unfavourable working conditions —catering, hotels and restaurants, and transport — psychosocial working conditions (high demands (only in catering, hotels and restaurants), low control and unskilled work) have been deteriorating. The changes in working conditions, particularly in the psychosocial domain, can be interpreted as the consequence of a further intensification of work in these two sectors. The same unfavourable change in psychosocial risks can be seen in wholesale/retail, a sector that is at average risk in 2000.

Another psychosocial risk that was found to be deteriorating, particularly for the 'high risk' sectors, is discrimination. This deterioration also applies to the 'average risk' sector of wholesale/retail, and the 'low risk' public and social sectors.

The two high risk sectors of catering, hotels and restaurants, and transport also show unfavourable scores on work-related stress problems, with transport also having unfavourable scores on work-related musculoskeletal problems. Workers in the catering, hotels and restaurants sector are extremely young, and it is possible that the working conditions in this sector, and the deterioration in these conditions, drives many workers out of this sector. According to our (more dated) research in this sector in the Netherlands (Houtman, van Deursen et al, 1992), this sector can be quite extreme and partly identifies companies with low absenteeism and quite a lot of older employees and trainees, and partly identifies companies with high absenteeism with no older employees or trainees. The transport sector is quite different, but both sectors have many self-employed workers. It is very unclear how this subpopulation characterises itself compared to the employees in these sectors on working conditions. One would expect some differences.

Unfavourable changes in ergonomic conditions can be seen in the typical 'blue-collar' sectors of manufacturing and building and construction. In these sectors the situation was already quite unfavourable with regard to ergonomic conditions. This development is therefore worrying, and should be studied in further detail, and where possible these risks should be tackled. It is probable, however, that there are fairly big differences between countries in the way these physical and postural risks are handled.

The changes in working conditions by sector as reported above are (specifically in the case of discrimination and to a minor extent in work speed) not consistent with a tendency of a 'regression towards the mean'.

Some working conditions or sector-specific scores on working conditions have remained quite stable over the last few years. Hardly any unfavourable change in aspects of working times could be identified for any sector. Ambient working conditions were also found to be quite stable.

'Stable' sectors with regard to working conditions are agriculture, public utilities and finance. In these sectors the recent turbulence in working life can probably be attributed to factors other than working conditions. This is probably particularly true for workers in agriculture and finance. The

fact that the working conditions appear so stable in public utilities seems to be largely due to the relatively small sample size, rather than to a real stable working conditions situation (see Appendix 9).

It is interesting to note that the public and social sectors were not at risk for unfavourable working conditions, but employees did report relatively high levels of work-related stress problems and (only the social sector) work-related musculoskeletal problems. These sectors have a high number of female workers, and a lot of workers are employees. It may be that factors other than working conditions alone are causing these health problems, for example, responsibilities for care at home, which is — even now — much more frequently provided by women than by men. Other, and particularly non-work-related, risks should be included to study this phenomenon better.

As the differences by sector could only be studied over two measurements in time, the significant differences may be the result of a minor change. We need more trends, as well as more comparisons with national data sets, also with respect to other characteristics. This does not mean that when a change is found to be significant that it should be doubted, but rather that these changes should be treated as highly suspect of indicating *stable* trends. They have to be proven consistent next time.

References

Ariëns, G.A.M., *Neck pain: work-related risk factors for neck pain* (academic thesis), Universiteit Vrije Wageningen, Amsterdam, Ponsen & Looijen BV, 2001.

Cohen J., *Statistical Power Analysis for the Behavioral Sciences*, Hillsdale, New Jersey, Lawrence Erlbaum Associates, 1988.

Dhondt S., Kraan, K., Sloten, G. van, *Work Organization Technology and Working Conditions in the Third European Survey on Working Conditions*, Hoofddorp, TNO Work & Employment, 2001.

European Agency for Safety and Health at Work, *The State of Occupational Safety and Health in the European Union: Pilot Study*, Belgium, 2000.

Houtman, I.L.D., Deursen, C.G.L. van, Gründemann, R.W.M. and Haanstra, G.A., *Oorzaken van en maatregelen bij ziekteverzuim in de horeca: een onderzoek onder bedrijven met een hoog en laag verzuim* (Causes of and Measures against Absenteeism in the Catering, Hotels and Restaurants Sector: A Study among Companies with Low and High Absenteeism), Leiden, NIPG-TNO, 1992. publ. nr. 92.053.

Houtman, I.L.D., Smulders, P.G.W., Klein Hesseling, *Trends in Arbeid 1999* (Work Trends 1999), Alphen a/d Rijn, Samsom, 1999.

Karasek, R., Theorell, T., *Healthy Work*, London, New York, Basic Books, 1990.

Veldhoven, M. van, Broersen, J.P.J., *Psychosociale arbeidsbelasting en werkstress in Nederland*, Amsterdam, SKB, 2000.

Appendices

Appendix 1
Information on working conditions and scale construction

working conditions	*# of items*	*items*	*range*	*recode Cronbach* α
ambient conditions	7	noise/vapour danger/vibrations high/low temperatures/radiation	1-7 always never	.79
ergonomic conditions	3	painfull posture/heavy work/repeated movements	1-7 always never	.69
non standard hours	5	at night/in evening/more than 10 hpd work on sundays/saturdays	# per month	.65
working hours	1	hours usually per week	1-18 categories	–
job demands		work at high speed/deadlines	1-7 always never	.65
job control	3	free to choose order/method/ speed	1-2 yes/no	.64
skilled work	6	meet standards /judge quality/ solving problems/monotonous/ complicated tasks/new things	1-2 yes/no	.74
task flexibility		job rotation/work in teams	1-2 yes/no	.63
social support	3	assistance/regular talks with colleagues c.q boss	1-2 yes/no	.77
discrimination	7	confrontation with physical violence/harassment discrimination from colleagues c.q. clients	1-2 yes/no	.59

contextual conditions	*# of items*	*items*	*range*
computer use	1	to work with computers	1-7 always never
telework	1	working at home with a computer	1-7 always never
work at home	1	working at home (not telework)	1-7 always never
customer contacts	1	direct contact with clients etc.	1-7 always never
second job	1	another job	1-2 yes/no

The category of repetitive tasks was eventually left out of the analyses because the question on repetitive tasks is somewhat ambiguous — there is no significant correlation with the answer to the question on repetitive arm or hand movements (elements of ergonomic conditions).

A Cronbach $\alpha \geq .80$ is considered very good; $.60 \leq \alpha < .80$ is fair, $.50 \leq \alpha < .60$ is poor; whereas Cronbach α below .50 are unacceptably low. An α of more than .50 for a two-item scale is, however,

always better than just using the single items. In some cases questions have been added in EF2000 that weren't in EF1995. However, in most cases the shorter scales, which could be defined for both surveys, were used.

The following concepts could exclusively be calculated for the EF2000 survey:

- Non-standard hours
- Task flexibility
- Social support
- Telework
- Work at home
- Second job

Appendix 2
Sectors according to NACE 2-digit level

Section			
A, B		Agriculture, hunting and forestry + Fishing	1 digit)
C		Mining and quarrying	(1 digit)
D		Manufacturing	(2 digits)
	15+16	Food products, beverages and tobacco	
	17+18+19	Cloths, textiles and leather	
	20+21	Wood industry, paper	
	22	Publishing, printing	
	23+24+25+26	Chemicals, rubber, mineral	
	27+28+29+30	Metal products and machinery	
	31+32+33	Electrical and electronics, precision instruments	
	34+35	Automobile and other transport equipment	
	36	Furniture	
E		Electricity, gas and water supply	(1 digit)
F		Construction	(1 digit)
G		Wholesale/retail trade, repair of motor vehicles, motorcycles and personal and household goods	(1 digit)
H		Catering, hotels and restaurants	(1 digit)
I		Transport, storage and communication	(2 digits)
	60	Land transport	
	61+62+63	Water, air sampling activities	
	64	Post and telecommunications	
J		Financial intermediation	(2 digits)
	65+67	Financial intermediation and auxiliary activities	
	66	Insurance	
K		Real estate, renting and business activities	(1 digit)
L		Public administration and defence; compulsory social security	(1 digit)
M		Education	(1 digit)
N		Health and social work	(1 digit)
O		Other community, social and personal service activities	(1 digit)
P+Q		Private households with employed persons; extra-territorial organisations and bodies	(1 digit)

Appendix 3
Information on statistical techniques used in this report

Several statistical analyses have been used in this report. First of all, we have standardised the scale means and ranges, in order to be able to equally compare scale rankings, including scales of different length (because they are constructed out of different numbers of items).

For each scale that is constructed, the Cronbach alpha coefficient, an indicator of scale homogeneity, is calculated. It gives a reliable indication of the extent (ranging from 0 to 1) to which the scale is homogenous, where 1 indicates complete homogeneity, and 0 indicates none.

In order to test differences between sector mean scores with the EU 'overall result', we used the technique of ANOVA (Analysis of Variance). To test if changes across time are significant, differences between sector mean scores on the indicators for the two EF surveys are seen as a 'repeated measure', and were tested as such with a MANOVA (Multivariate Analysis of Variance) technique. The latter technique is highly related to the ANOVA, but allows for the use of repeated measures and more than one independent variable. In the text below, we will present some additional information on Z-scores, Cronbach alpha, and (M)ANOVAs.

Standardising scores by calculation of Z-scores

In the analyses used in this study, we constructed several scales in order to be more reliable in our assessment of the risk concept that was measured. For measuring several concepts, more questions were asked on a particular topic, for example, quantitative job demands, autonomy, social support. Considering these questions individually would be cumbersome, because the questions designed to measure a certain concept would certainly be related, and therefore presenting and discussing findings would result in a lot of repetition. Also, considering these questions individually would be confusing because the findings might not be exactly the same, for example, sector rankings on individual items. This has to do with the fact that scores on individual questions have a certain unreliability. Repeatedly asking about the same concept results in a more reliable score and ranking on that concept.

Because constructing scales would result in scales with a different number of items, and thus differences in absolute means and ranges, probably impairing the interpretation of sector profiles, standardisation was considered essential. This is particularly the case when different risk concepts are included within the sector profiles.

> 'The Z-score variable transformation is the most common and universally utilised method for standardising a scale that indicates a concept. The Z-score transformation generates a new variable with a mean of 0 (zero) and a standard deviation of 1 (so the standard deviation will range from –1.0 to +1.0). Each case in the file then contains a value equivalent to the number of standard deviation units that is above or below the mean. Z-scores are computed by subtracting the mean of the variable from the individual value of each case, and dividing that remainder by the standard deviation.

The formula for the Z-score transformation is:

$$\frac{X_i - \bar{X}}{SD}$$

Where X_i is the original value of the i-th case in the file for the variable being transformed, X is the mean of the variable, and SD is the standard deviation.'[1]

Reliability and interval consistency of scales: Cronbach alpha

The internal consistency of a scale is often considered to be an important indicator of the reliability of that scale. It indicates the degree to which the different items of that scale equally contribute to the total scale score. The Cronbach alpha is one of the indicators of the internal consistency of a particular scale. It provides an average indication of the internal consistency of a scale, and ranges from 0 (which will hardly ever occur since this means absolutely no coherence between the answers given to the questions assumed to construe the scale) to 1.0 (which is also not realistic, because this would mean that everybody answered a 'yes' or a 'no', or exactly the same score on each question assumed to construct the scale). In general, for a Cronbach $\alpha \geq .80$ the internal consistency is considered very good; $.60 \leq \alpha < .80$ it is considered fair, $.50 \leq \alpha < .60$ it is considered poor; whereas a Cronbach α below .50 is considered unacceptably low. Within the formula of Cronbach alpha, the number of items is a constant, resulting in a higher Cronbach alpha for longer scales. Long scales might, however, not necessarily be the most efficient ones. Although a scale consisting of only two items is very minimal, a Cronbach α of more than .50 for a two-item scale is always better than just using the single items.

The formula for the Cronbach alpha (or Kuder-Richardson; KR-20), is[2]:

$$R_{it} = \frac{n}{n-1} \frac{s_t - \Sigma pq}{s_t^2}$$

Where:
n = number of items
Σ pq = the sum of item variances
s_t = variance of the total scale

Testing against the 'overall result', and against measuring earlier times

Within this study we test if sectors differ from the 'overall result', i.e. the rest of the EU sample except the sector chosen 'to be compared with' a sector average. When sector size is quite evenly distributed between 'target groups' using the average or 'overall result', this would hardly result in differences. When we look at 'sector' in particular, the size of the target group appears to vary a lot. This means that the large target groups such as manufacturing add to the average considerably more than relatively small sectors. Therfore the contrast between sectors is much smaller for these larger sectors as compared to the contrast for the smaller ones. In order to correct this, we will test

[1] Nie, N.H., Hull, C.H., Jenkins, J.G., Steinberger, K., Bent, D.H., *Manual to the Statistical Package for the Social Sciences (SPSS)*, 2nd edition, McGraw-Hill, New York, 1975.

[2] Magnusson, David, *Test Theory,* Addison-Wesley, Reading, 1967.

against the 'overall result'. The 'overall result' is the reference group except those working in that particular sector.

To test the differences, ANOVAs are used[3]. When repeated measures are involved, as is the case when describing change across the period 1995-2000, a MANOVA is the best statistical option.

Testing against the overall result: Use of ANOVA

The basic ANOVA is the decomposition of variation (i.e. sum of squares, corrected for the mean). Considering a one-way analysis (for example, one sector against the overall result), there are two independent components predicting the score on a variable (dependent variable):

SSy = SS between + SS within

Where $SS_y = \Sigma_j \Sigma_i (Y_{ji} - Y)^2$

Y is the mean of the whole sample (the 'grand mean'), and the summations are over all individual cases 'i' in each category/sector 'j' of the (risk) factor A.

SS between = $\Sigma Nj\ (Yj. - Y)\ 2$

in which Yj. is the mean of Y in the category j (sector), and Nj is the number of employees in this sector

SS within = $\Sigma_j \Sigma_i\ (Yji - Y\ j.)2$

SS between is the portion of the sum of squares in *Y due to risk factor A*, that is, due to the variation in $Y_{j,}$ means of the categories of the risk factor.

In analyses of variance, the effects of A (in this case this is sector) are often expressed by the sum of the squared differences of the factor A category means of the Y variable on the overall mean of Y (either a risk factor, or a work-related complaint…dependent on the comparison tested).

Changes across time

To test if changes across time are significant, differences between sector means on the indicators for the two surveys are seen as a 'repeated measure', and tested with a MANOVA. This means that the independent variable is 'predicted' by not only one, but multiple independent variables. This results in equations such as:

$Y = k + ax_1 + bx_2 + cx_3 + ... + E$

Where:

[3] This chapter in the SPSS manual is written by J. O. Kim and F.J. Kohout.

Y = the dependent variable

K = a constant factor

$X_{i\text{-}ii}$ are different determinants

A, b, c, etc. are loadings for the different risk factors on the outcome measure, taking into account the other (potential) predictors

E = the error term

Appendix 4
Characterisation of sectors by gender, age and job status

Characterisation of the sectors by gender

Sector	Gender		Total
	Male	Female	
Agriculture	68.0%	32.0%	100.0%
Food industry	61.3%	38.7%	100.0%
Textiles	34.1%	65.9%	100.0%
Chemicals	75.2%	24.8%	100.0%
Metals	82.2%	17.8%	100.0%
Electrical	65.8%	34.2%	100.0%
Misc. manuf.	78.0%	22.0%	100.0%
Public utilities	83.4%	16.6%	100.0%
Construction	92.1%	7.9%	100.0%
Wholesale/retail	50.5%	49.5%	100.0%
Catering, hotels/rest.	44.0%	56.0%	100.0%
Transport	82.2%	17.8%	100.0%
Post and telecom.	64.0%	36.0%	100.0%
Finance	51.9%	48.1%	100.0%
Real estate	57.2%	42.8%	100.0%
Public sector	59.4%	40.6%	100.0%
Education	34.7%	65.3%	100.0%
Social sector	27.0%	73.0%	100.0%
Total	54.9%	45.1%	100%

Characterisation of the sectors by age

Sector	Age				Total
	15-25 years	26-44 years	45-64 years	65+ years	
Agriculture	8.9%	38.2%	48.1%	4.9%	100.0%
Food industry	17.6%	51.3%	31.0%	0.2%	100.0%
Textiles	16.0%	49.2%	34.1%	0.7%	100.0%
Chemicals	13.9%	56.8%	28.6%	0.7%	100.0%
Metals	12.3%	56.0%	31.1%	0.6%	100.0%
Electrical	14.6%	59.5%	25.2%	0.7%	100.0%
Misc. manuf.	13.2%	52.4%	33.6%	0.8%	100.0%
Public utilitie	10.2%	54.5%	34.8%	0.5%	100.0%
Construction	14.3%	53.4%	31.8%	0.6%	100.0%
Wholesale/retail	19.6%	51.7%	27.3%	1.5%	100.0%
Catering, hotels/rest.	28.2%	50.2%	20.7%	0.9%	100.0%
Transport	9.0%	55.4%	35.2%	0.4%	100.0%
Post and telecom.	13.2%	57.7%	28.9%	0.2%	100.0%
Finance	9.8%	59.2%	30.5%	0.5%	100.0%
Real estate	16.6%	55.8%	26.6%	1.0%	100.0%
Public sector	7.3%	53.5%	38.8%	0.3%	100.0%
Education	7.0%	52.9%	39.5%	0.6%	100.0%
Social sector	12.0%	55.7%	31.2%	1.1%	100.0%
Total	13.9%	53.4%	31.6%	1.0%	100.0%

Characterisation of the sectors by job status

Sector	Job status			Total
	Self-employed without employees	Self-employed with employees	Employed	
Agriculture	55.2%	9.4%	35.4%	100.0%
Food industry	2.1%	4.0%	93.9%	100.0%
Textiles	16.1%	4.9%	79.1%	100.0%
Chemicals	1.4%	2.3%	96.2%	100.0%
Metals	3.7%	3.7%	92.7%	100.0%
Electrical	6.0%	2.3%	91.6%	100.0%
Misc. manuf.	7.1%	6.0%	86.9%	100.0%
Public utilities	4.9%	2.2%	93.0%	100.0%
Construction	12.0%	8.1%	79.9%	100.0%
Wholesale/retail	20.8%	7.7%	71.5%	100.0%
Catering, hotels/rest.	12.6%	9.7%	77.7%	100.0%
Transport	10.9%	3.1%	86.0%	100.0%
Post and telecom.	1.9%	0.7%	97.4%	100.0%
Finance	7.4%	5.1%	87.5%	100.0%
Real estate	13.6%	5.8%	80.6%	100.0%
Public sector	0.9%	0.5%	98.6%	100.0%
Education	2.9%	1.1%	95.9%	100.0%
Social sector	9.8%	2.8%	87.4%	100.0%
Total	12.0%	4.8%	83.2%	100.0%

Appendix 5
Results of statistical tests

Statistical tests on differences between sectors and the 'overall result' per working condition in 2000 and for trends from 1995-2000

++/— p< .0001
+/- .05<p<.001
+/++ = favourable change
-/— = unfavourable change

Sector profiles 2000 (minus=more unfavourable; plus=more favourable)

	ambient conditions	ergonomic conditions	non-standard hours	working hours	job demands	job control
Agriculture	—	—	—	—	+	++
Food industry	—	—	ns	ns	—	—
Textiles	—	—	++	-	ns	—
Chemicals	—	Ns	++	-	ns	—
Metals	—	—	++	-	—	ns
Electrical	—	Ns	++	ns	ns	+
Misc. manuf.	—	—	++	-	—	-
Public utilities	-	Ns	++	-	ns	+
Construction	—	—	++	—	—	ns
Wholesale/retail	++	++	—	—	++	+
Catering, hotels/rest.	+	—	—	—	—	—
Transport	—	—	—	—	—	—
Post and telecommunications	++	Ns	++	+	—	-
Finance	++	++	++	ns	ns	++
Real estate	++	++	++	-	—	++
Public sector	++	++	++	++	++	+
Education	++	++	++	++	++	—
Social sector	++	Ns	ns	++	++	+
N=	21.392	21.538	20.640	21.508	20.499	20.796

	skilled work	task flexibility	social support	discri-mination
Agriculture	—	—	—	++
Food industry	—	++	Ns	++
Textiles	-	-	—	++
Chemicals	++	++	++	+
Metals	++	+	++	++
Electrical	++	+	++	++
Misc. manuf.	++	+	+	++
Public utilities	+	+	++	+
Construction	++	+	—	++
Wholesale/retail	—	—	—	+
Catering, hotels/rest.	—	++	—	—
Transport	—	-	Ns	—
Post and telecommunications	ns	Ns	++	ns
Finance	++	Ns	++	+
Real estate	++	—	Ns	+
Public sector	ns	++	++	—
Education	++	-	++	ns
Social sector	ns	++	+	—
N=	20.568	21.392	20.733	21.533

Contextual conditions 2000 (minus=more unfavourable; plus=more favourable)

	use computers	telework	work at home	customer contacts	second job
Agriculture	—	—	++	—	ns
Food industry	—	-	ns	—	ns
Textiles	—	-	ns	—	+
Chemicals	Ns	ns	—	—	ns
Metals	Ns	ns	—	—	ns
Electrical	++	ns	-	—	ns
Misc. manuf.	Ns	ns	—	—	ns
Public utilities	++	ns	ns	—	ns
Construction	—	-	—	—	+
Wholesale/retail	—	—	—	++	+
Catering, hotels/rest.	—	—	—	++	+
Transport	-	ns	—	+	ns
Post and telecommunications	++	++	ns	ns	ns
Finance	++	++	+	+	ns
Real estate	++	++	++	—	-
Public sector	++	ns	—	—	ns
Education	Ns	++	++	++	—
Social sector	—	—	+	++	—
N=	21.628	21.588	21.532	21.635	20.899

	Stress	Muscular
Agriculture	n.s.	—
Food industry	+	n.s.
Textiles	n.s.	—
Chemicals	n.s.	+
Metals	n.s.	n.s.
Electrical	n.s.	n.s.
Misc. manuf.	n.s.	n.s.
Public utilities	n.s.	n.s.
Construction	++	—
Wholesale/retail	++	++
Catering, hotels/rest.	—	n.s.
Transport	—	—
Post and telecommunications	n.s.	n.s.
Finance	n.s.	++
Real estate	++	++
Public sector	-	++
Education	—	++
Social sector	—	—
n=	21.703	21.703

Trends 1995-2000 (minus=unfavourable; plus=favourable)

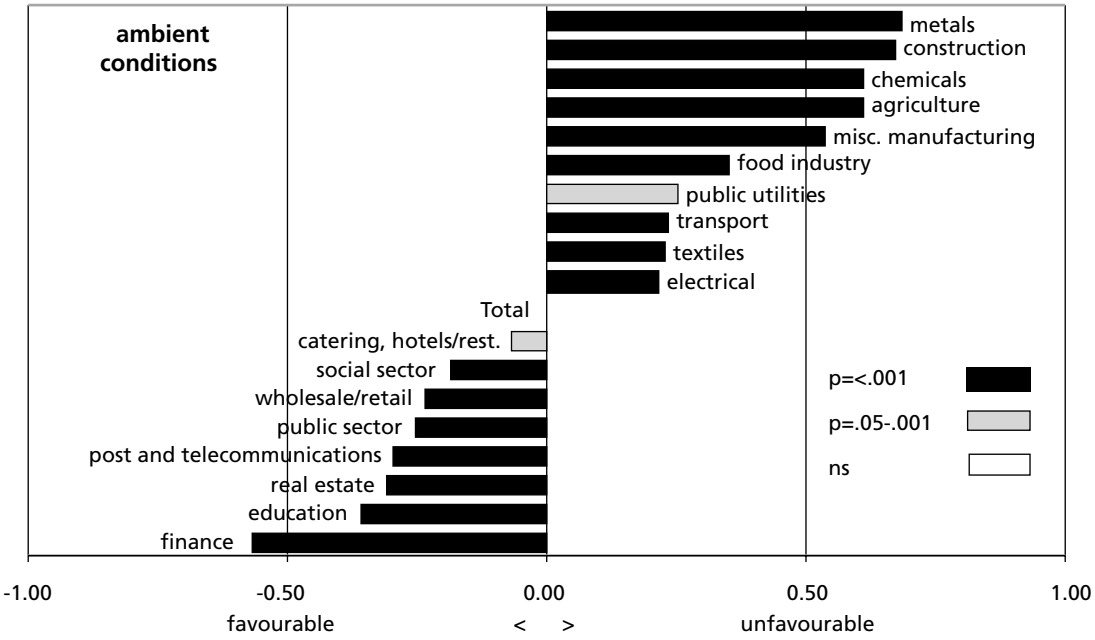
	ambient conditions	ergonomic conditions	work weekend	working hours
Agriculture	Ns	Ns	ns	++
Manufacturing	+	—	+	++
Public utilities	Ns	Ns	ns	ns
Construction	Ns	—	+	ns
Wholesale/retail	-	Ns	ns	++
Catering, hotels/rest.	Ns	Ns	ns	++
Transport	Ns	Ns	ns	++
Finance	Ns	Ns	ns	+
Real estate	Ns	Ns	++	ns
Public sector	Ns	Ns	++	ns
Social sector	Ns	-	ns	++
Total	***Ns***	**-**	**+**	**++**

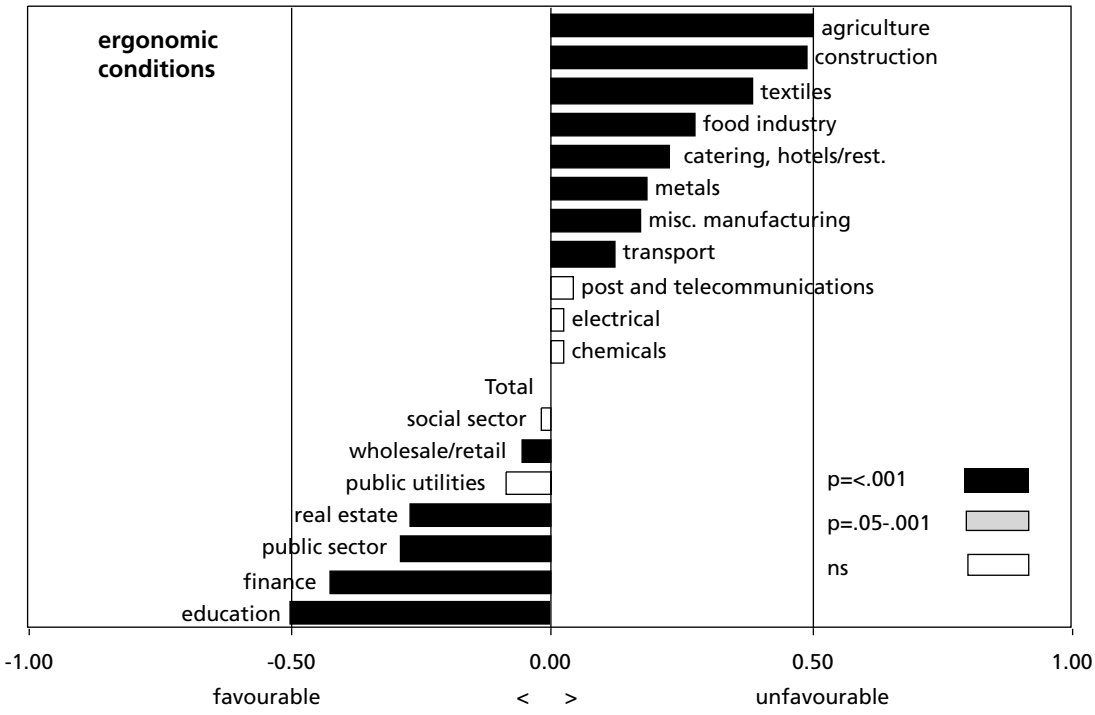
	job demands	job control	skills	discrimination
Agriculture	Ns	Ns	ns	ns
Manufacturing	Ns	Ns	-	ns
Public utilities	Ns	Ns	ns	-
Construction	Ns	Ns	ns	ns
Wholesale/retail	-	—	—	-
Catering, hotels/rest.	-	-	-	-
Transport	Ns	—	—	-
Finance	Ns	Ns	ns	ns
Real estate	—	Ns	ns	ns
Public sector	Ns	Ns	—	ns
Social sector	Ns	—	—	—
Total	**-**	**—**	**—**	**—**

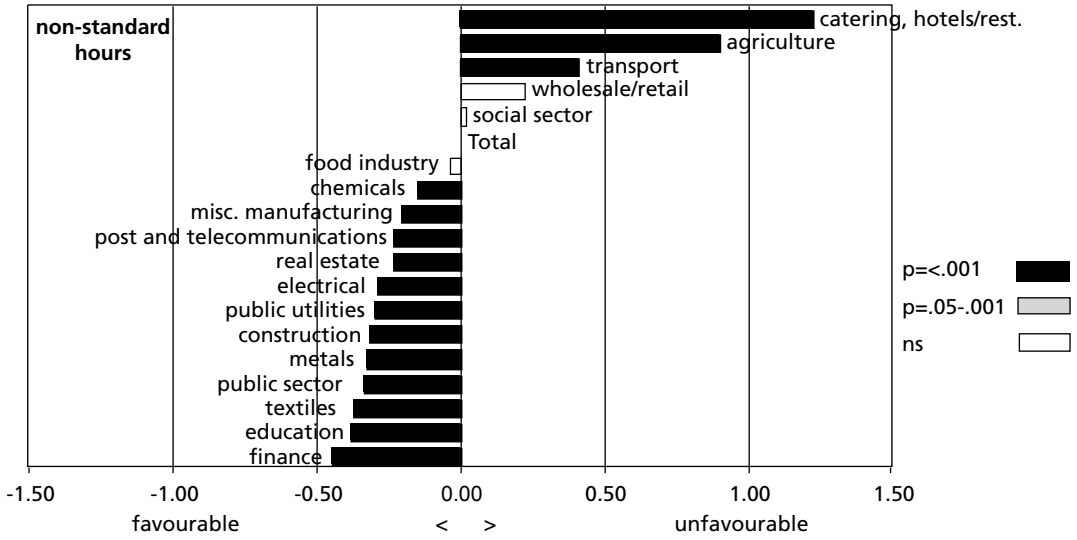
Contextual conditions 1995-2000 (plus=increase; minus =decrease)

	use computers	customer contacts
Agriculture	Ns	ns
Manufacturing	+	—
Public utilities	Ns	ns
Construction	-	—
Wholesale/retail	++	—
Catering, hotels/rest.	Ns	ns
Transport	+	-
Finance	++	-
Real estate	++	—
Public sector	++	—
Social sector	Ns	ns
Total	**++**	**—**

Appendix 6
Graphical presentation of ranking of sectors per working condition






non-standard hours
catering, hotels/rest.
agriculture
transport
wholesale/retail
social sector
Total
food industry
chemicals
misc. manufacturing
post and telecommunications
real estate
electrical
public utilities
construction
metals
public sector
textiles
education
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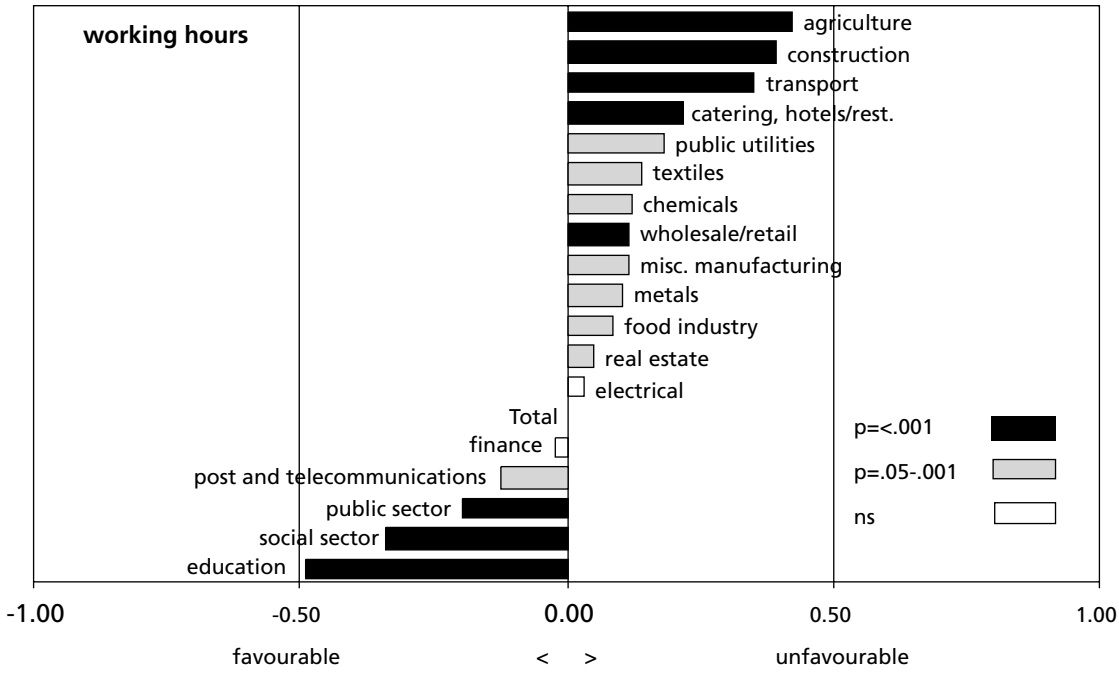
working hours
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chemicals
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finance
post and telecommunications
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social sector
education
p=<.001
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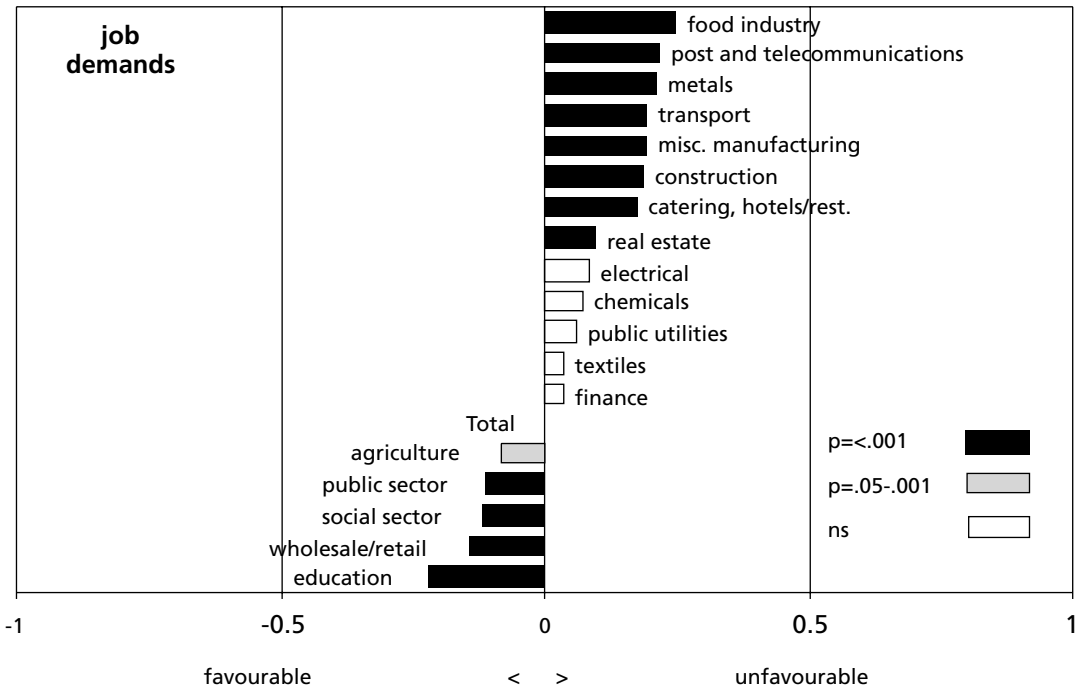
job demands
food industry
post and telecommunications
metals
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misc. manufacturing
construction
catering, hotels/rest.
real estate
electrical
chemicals
public utilities
textiles
finance
Total
agriculture
public sector
social sector
wholesale/retail
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p=<.001
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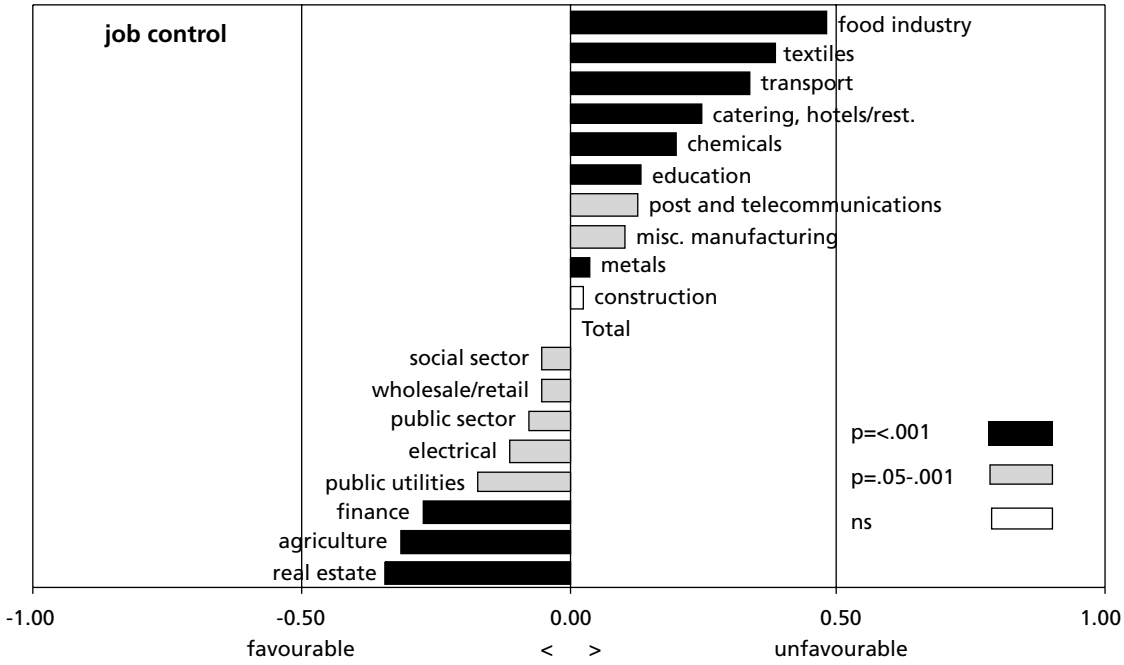
job control
food industry
textiles
transport
catering, hotels/rest.
chemicals
education
post and telecommunications
misc. manufacturing
metals
construction
Total
social sector
wholesale/retail
public sector
electrical
public utilities
finance
agriculture
real estate
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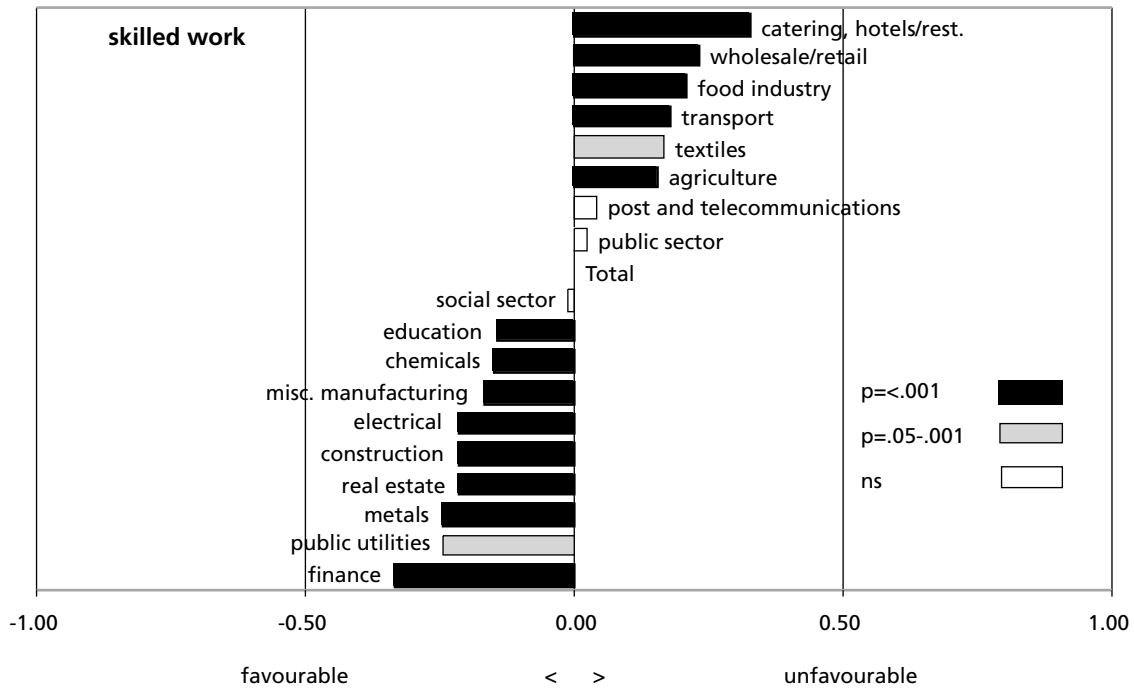
unfavourable


skilled work
catering, hotels/rest.
wholesale/retail
food industry
transport
textiles
agriculture
post and telecommunications
public sector
Total
social sector
education
chemicals
misc. manufacturing
electrical
construction
real estate
metals
public utilities
finance
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favourable
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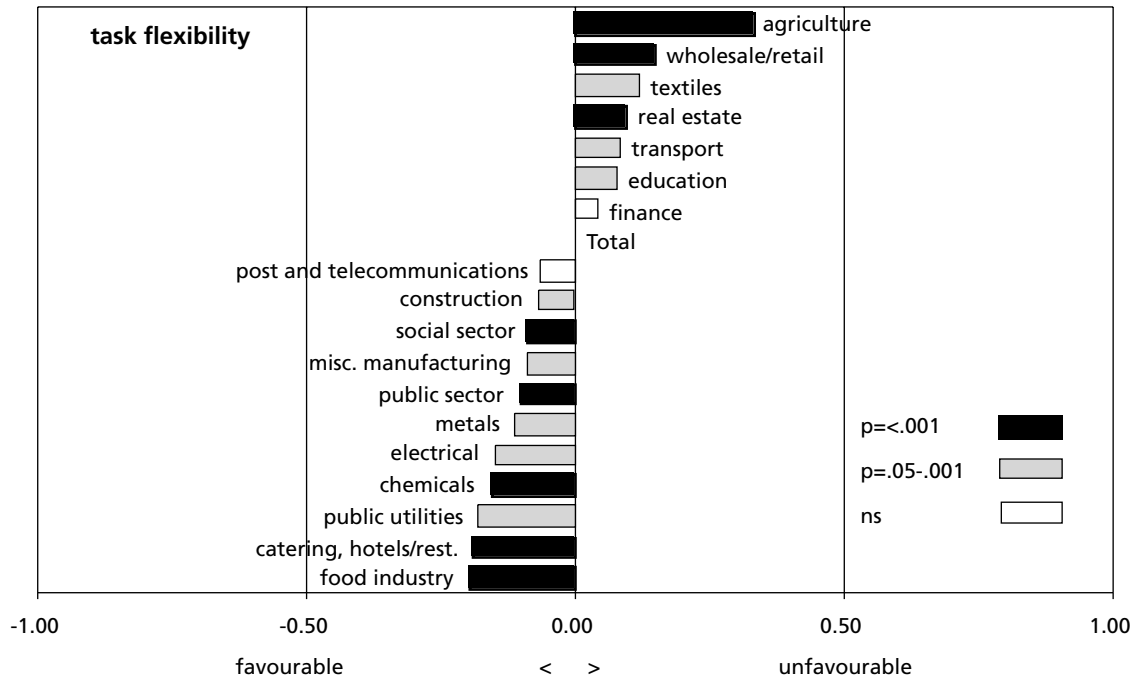
task flexibility
agriculture
wholesale/retail
textiles
real estate
transport
education
finance
Total
post and telecommunications
construction
social sector
misc. manufacturing
public sector
metals
electrical
chemicals
public utilities
catering, hotels/rest.
food industry
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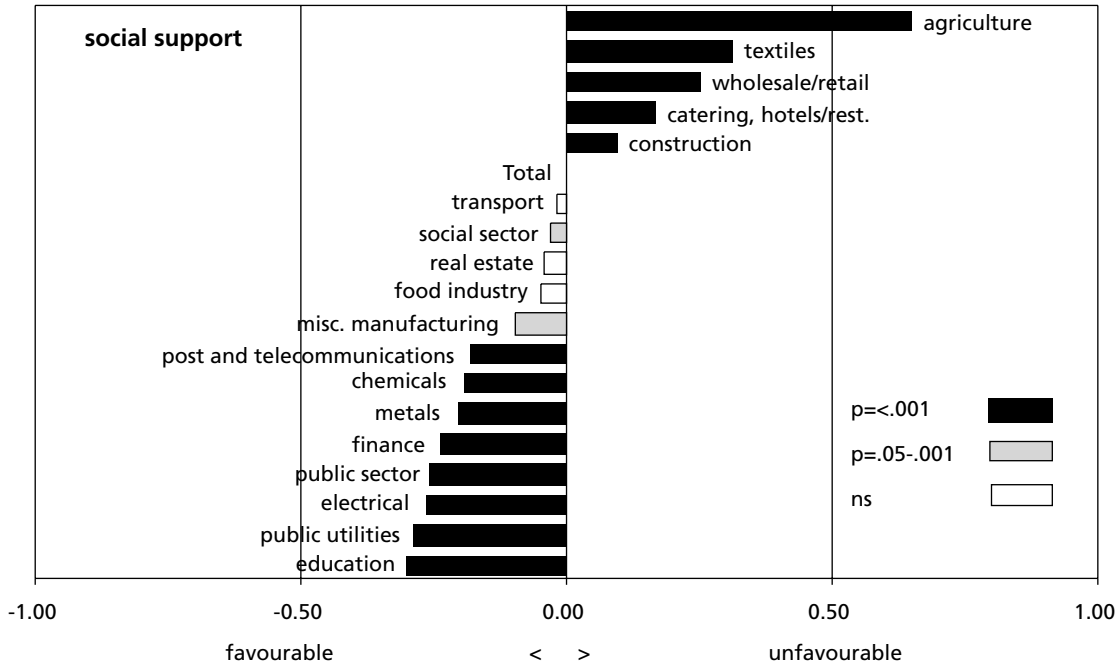
social support
agriculture
textiles
wholesale/retail
catering, hotels/rest.
construction
Total
transport
social sector
real estate
food industry
misc. manufacturing
post and telecommunications
chemicals
metals
finance
public sector
electrical
public utilities
education
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favourable
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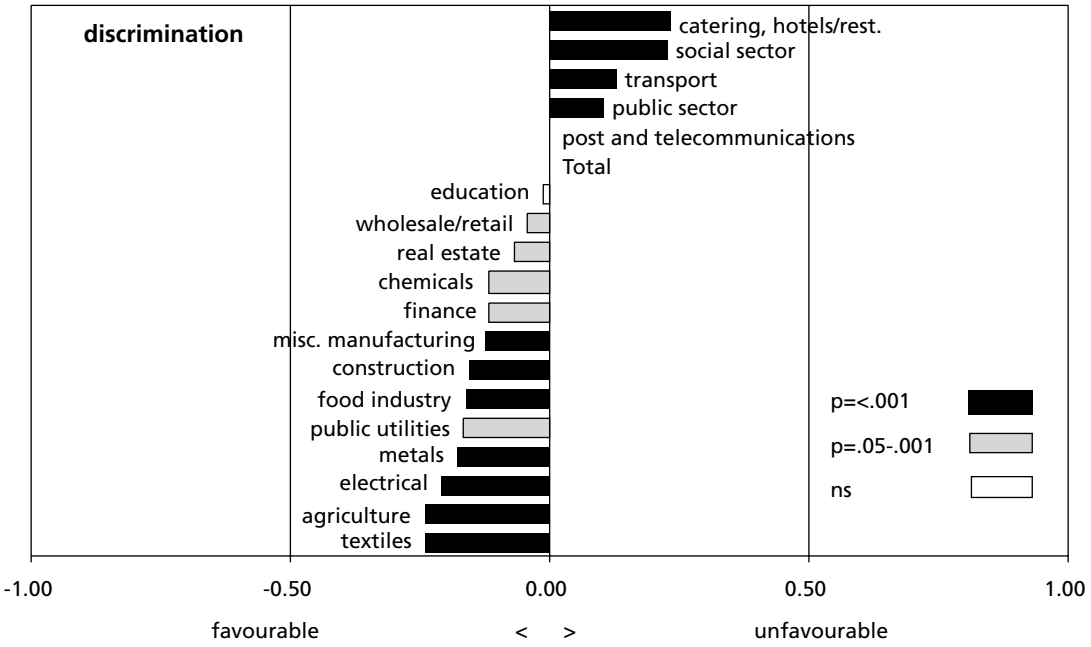
unfavourable


discrimination
catering, hotels/rest.
social sector
transport
public sector
post and telecommunications
Total
education
wholesale/retail
real estate
chemicals
finance
misc. manufacturing
construction
food industry
public utilities
metals
electrical
agriculture
textiles
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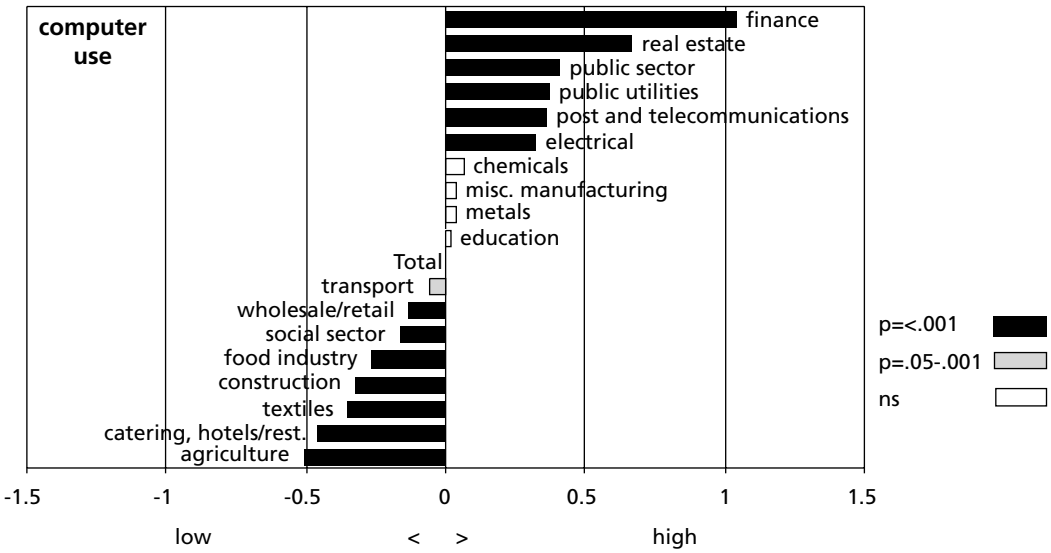
unfavourable


computer use
finance
real estate
public sector
public utilities
post and telecommunications
electrical
chemicals
misc. manufacturing
metals
education
Total
transport
wholesale/retail
social sector
food industry
construction
textiles
catering, hotels/rest.
agriculture
p=<.001
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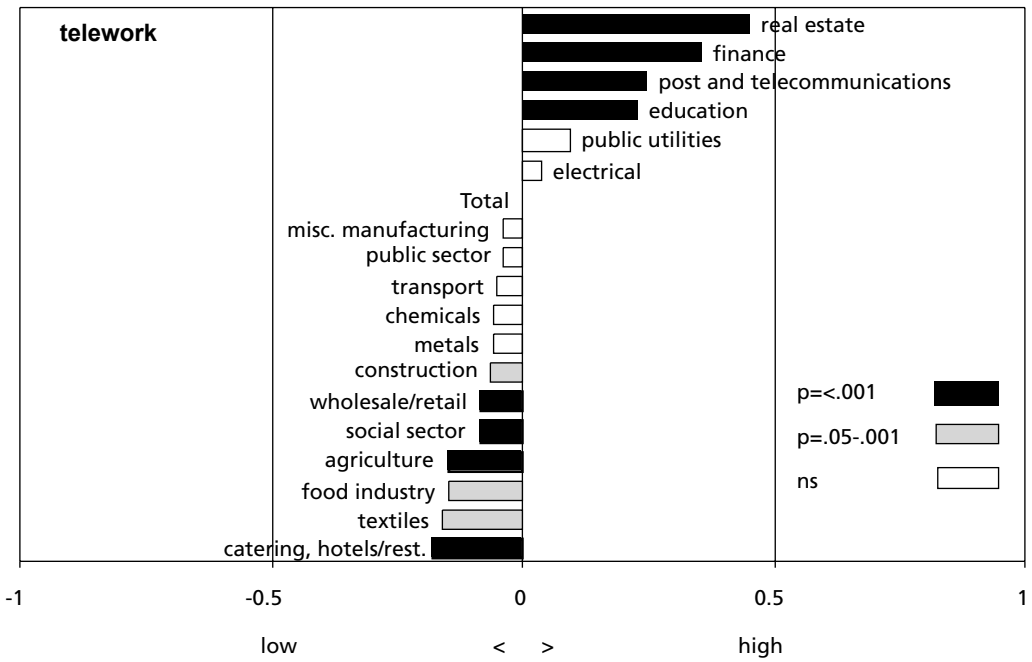
high


telework
real estate
finance
post and telecommunications
education
public utilities
electrical
Total
misc. manufacturing
public sector
transport
chemicals
metals
construction
wholesale/retail
social sector
agriculture
food industry
textiles
catering, hotels/rest.
p=<.001
p=.05-.001
ns
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-0.5
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low
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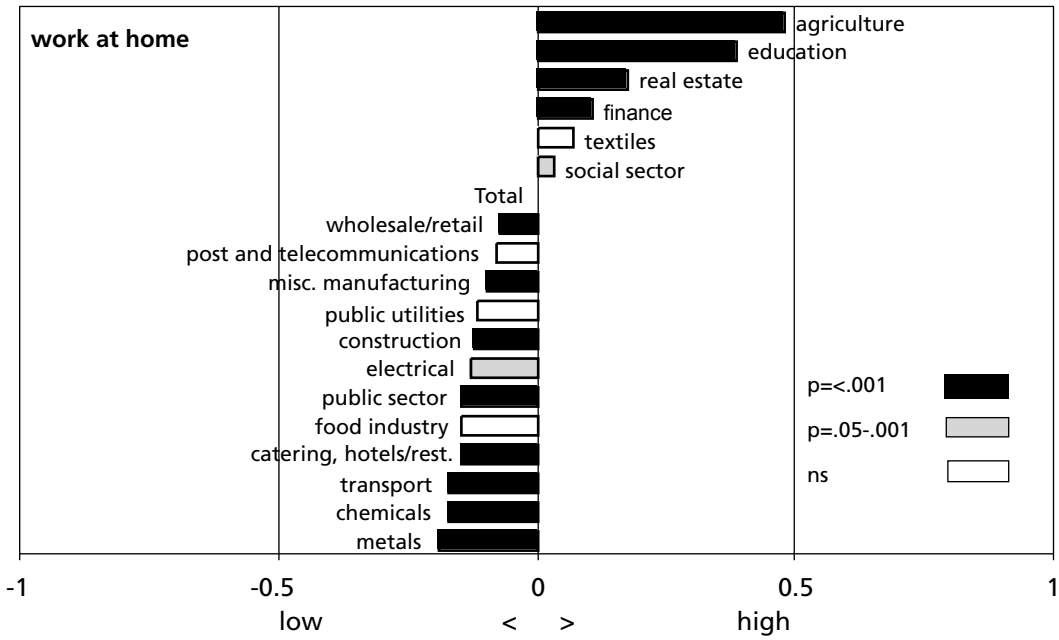
>
high


work at home
agriculture
education
real estate
finance
textiles
social sector
Total
wholesale/retail
post and telecommunications
misc. manufacturing
public utilities
construction
electrical
public sector
food industry
catering, hotels/rest.
transport
chemicals
metals
p=<.001
p=.05-.001
ns
-1
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0
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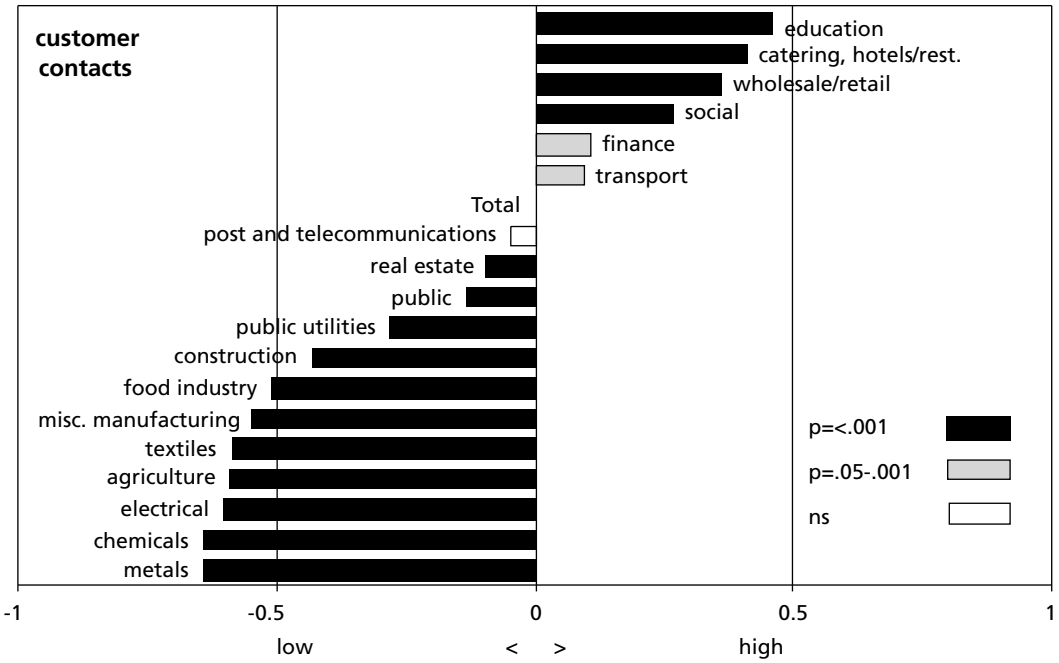
1
low
<
>
high


customer contacts
education
catering, hotels/rest.
wholesale/retail
social
finance
transport
Total
post and telecommunications
real estate
public
public utilities
construction
food industry
misc. manufacturing
textiles
agriculture
electrical
chemicals
metals
p=<.001
p=.05-.001
ns
-1
-0.5
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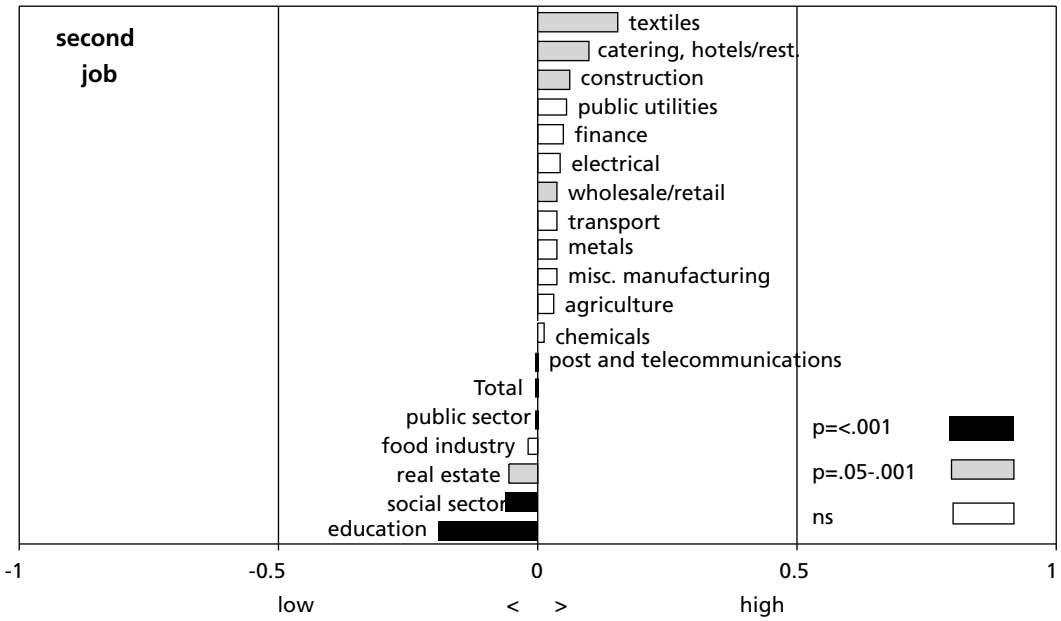
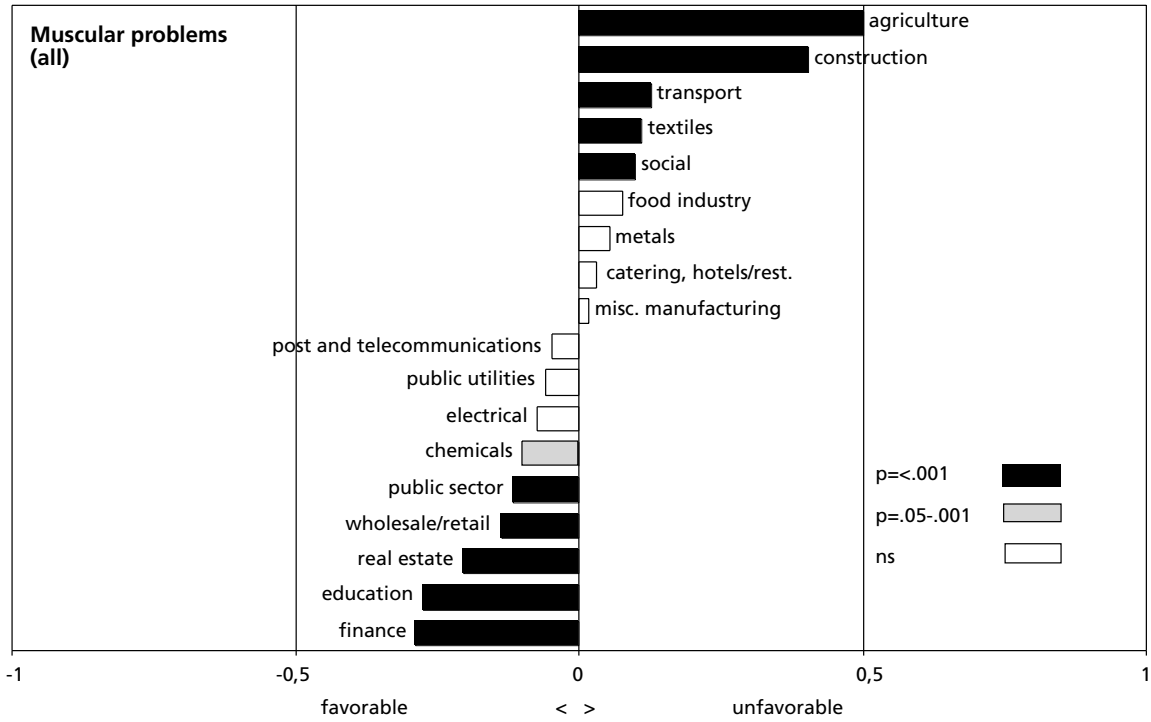
1
low
<
>
high


second job
textiles
catering, hotels/rest.
construction
public utilities
finance
electrical
wholesale/retail
transport
metals
misc. manufacturing
agriculture
chemicals
post and telecommunications
Total
public sector
food industry
real estate
social sector
education
p=<.001
p=.05-.001
ns
-1
-0.5
0
0.5
1
low
<
>
high


Muscular problems (all)
agriculture
construction
transport
textiles
social
food industry
metals
catering, hotels/rest.
misc. manufacturing
post and telecommunications
public utilities
electrical
chemicals
public sector
wholesale/retail
real estate
education
finance
p=<.001
p=.05-.001
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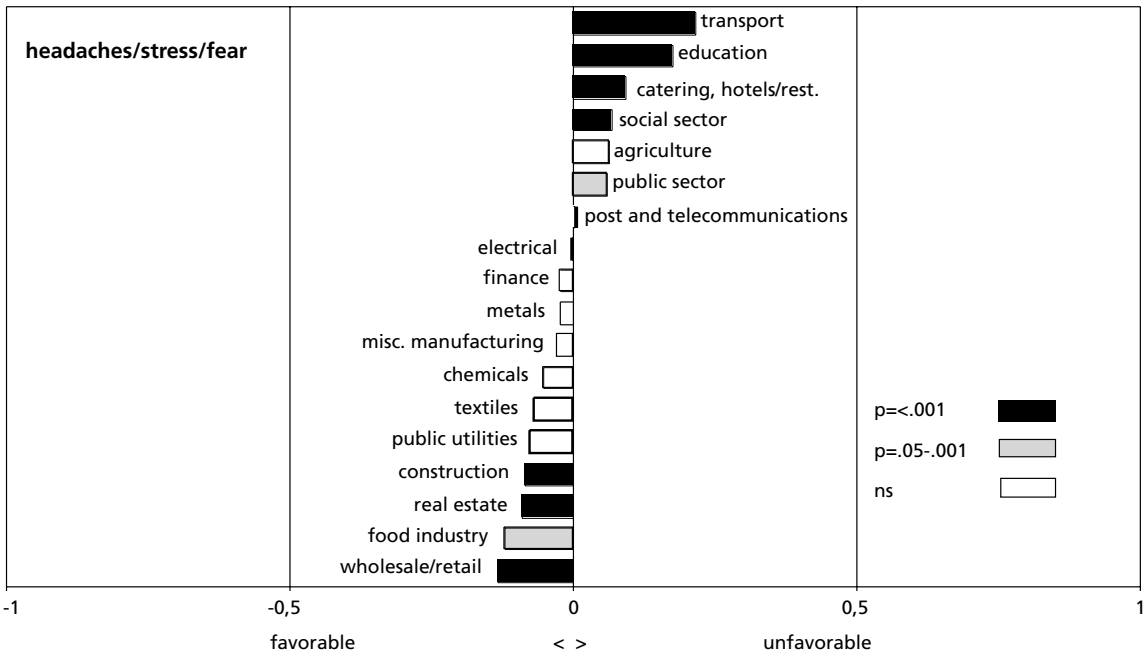
-0,5
0
0,5
1
favorable
< >
unfavorable


headaches/stress/fear
transport
education
catering, hotels/rest.
social sector
agriculture
public sector
post and telecommunications
electrical
finance
metals
misc. manufacturing
chemicals
textiles
public utilities
construction
real estate
food industry
wholesale/retail
p=<.001
p=.05-.001
ns
-1
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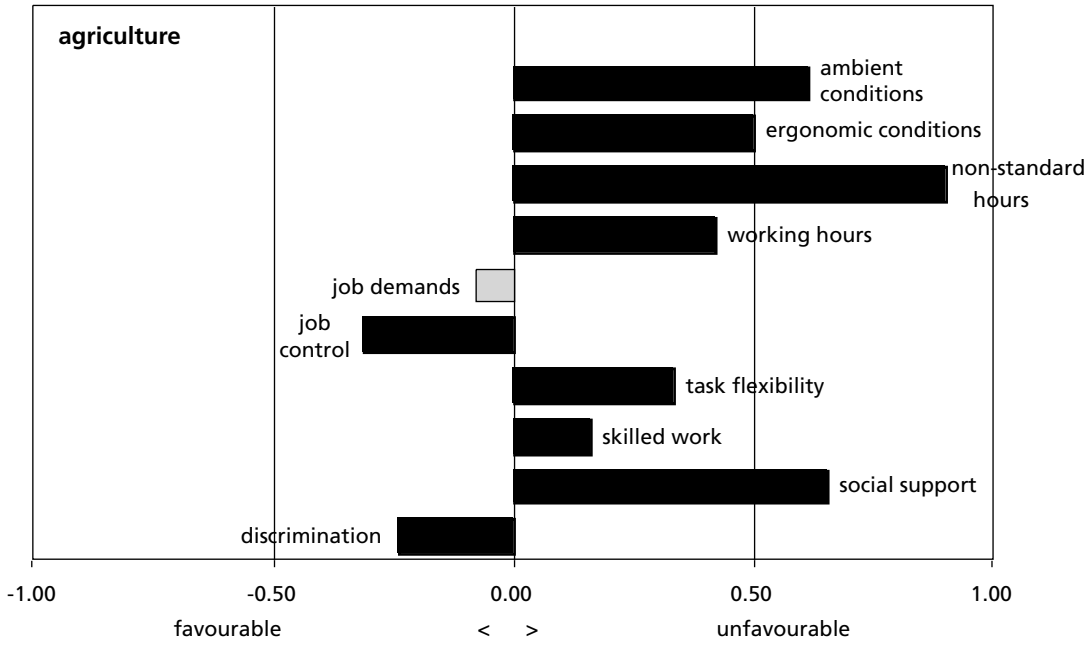
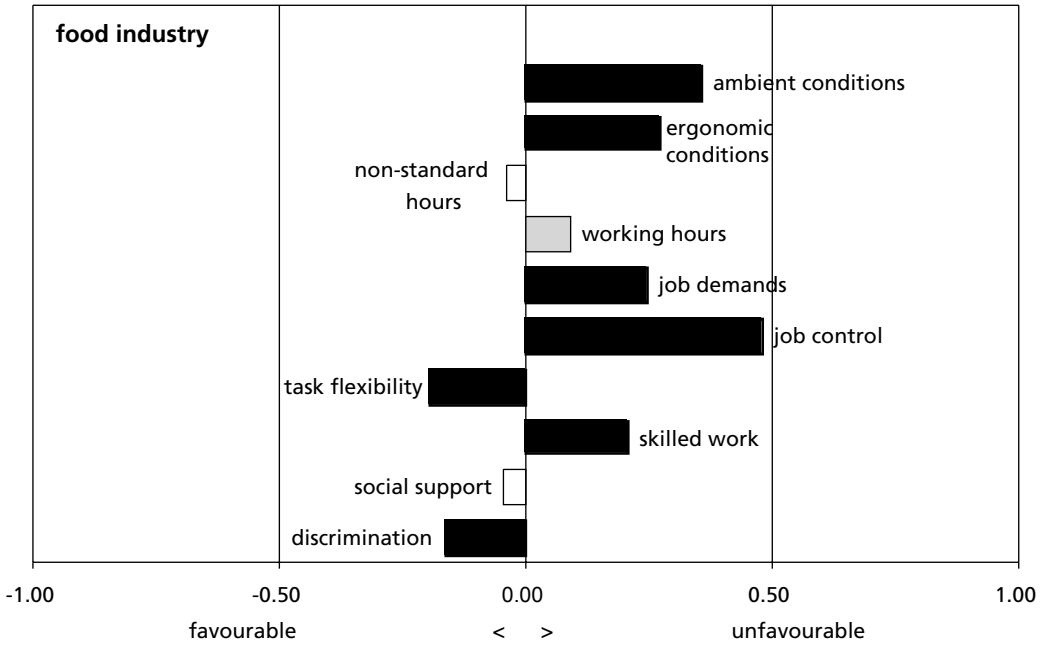
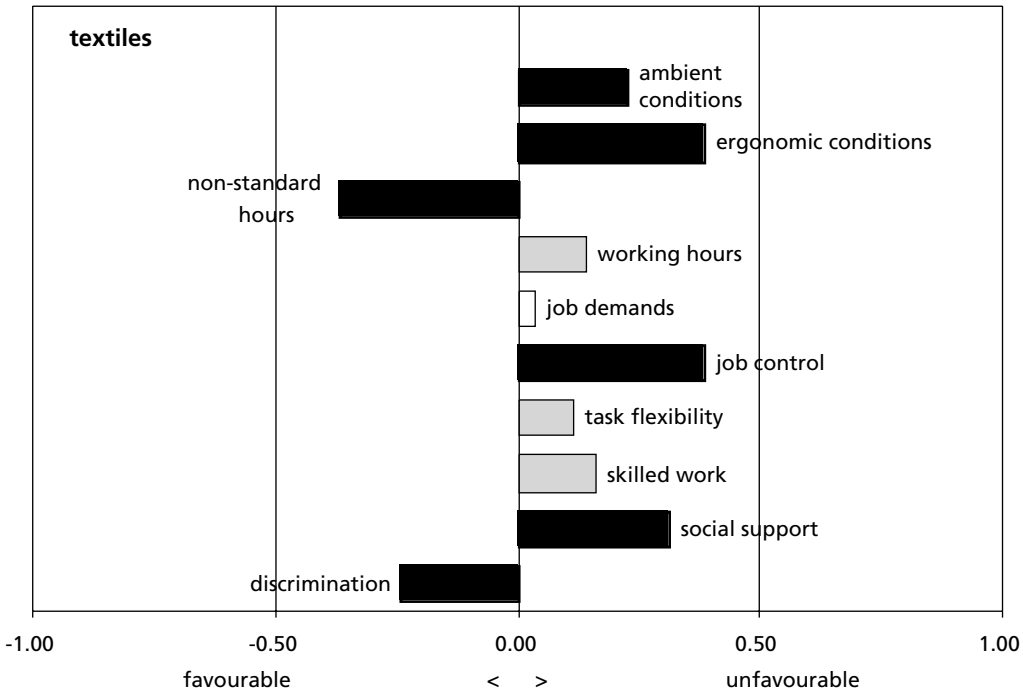
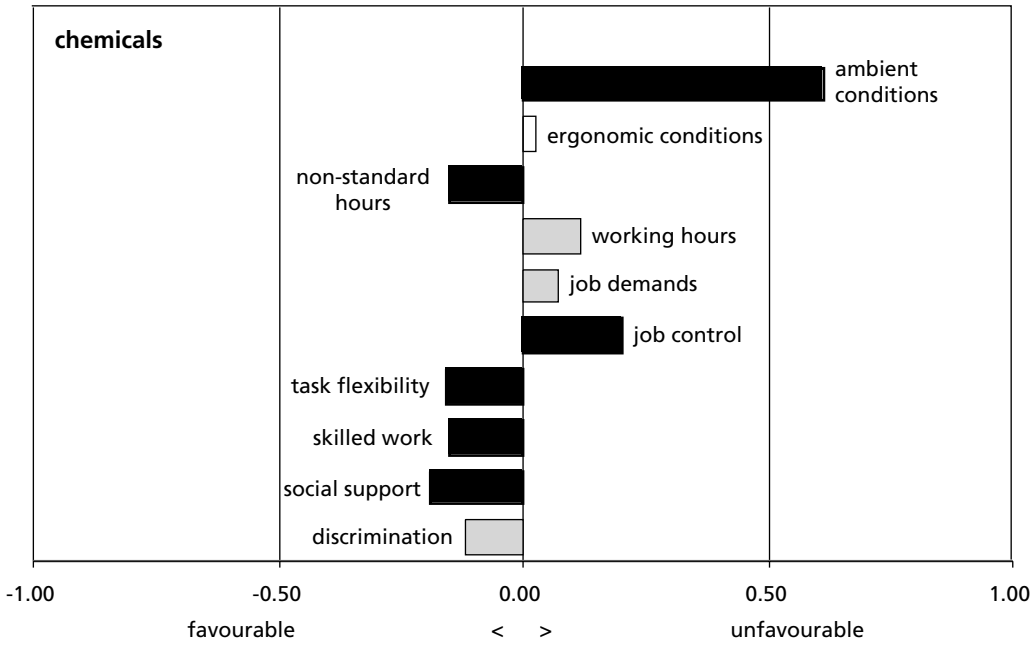
favorable
< >
unfavorable

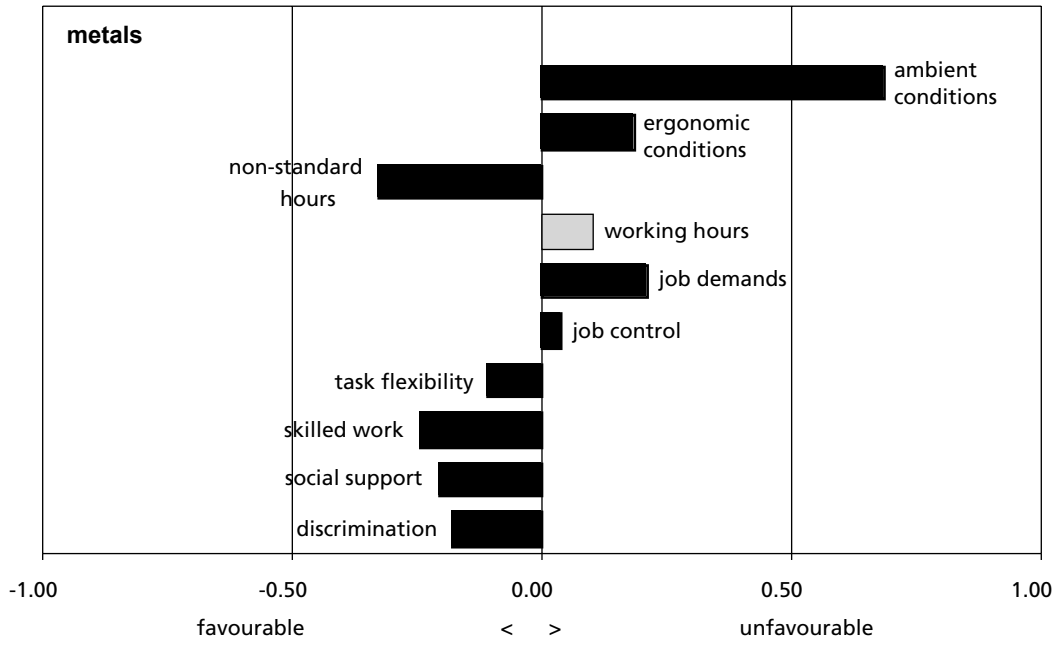
Appendix 7
Sector profile graphics






textiles
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
0.50
1.00
favourable
<
>
unfavourable


chemicals
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
0.50
1.00
favourable
<
>
unfavourable


metals
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
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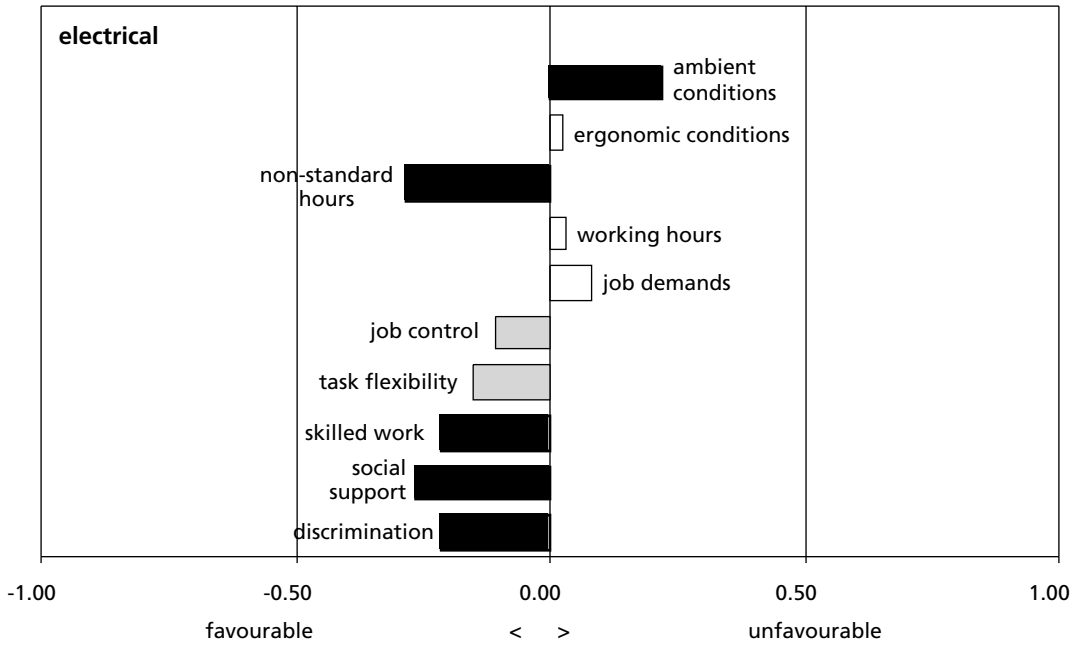
favourable
<
>
unfavourable


electrical
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
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favourable
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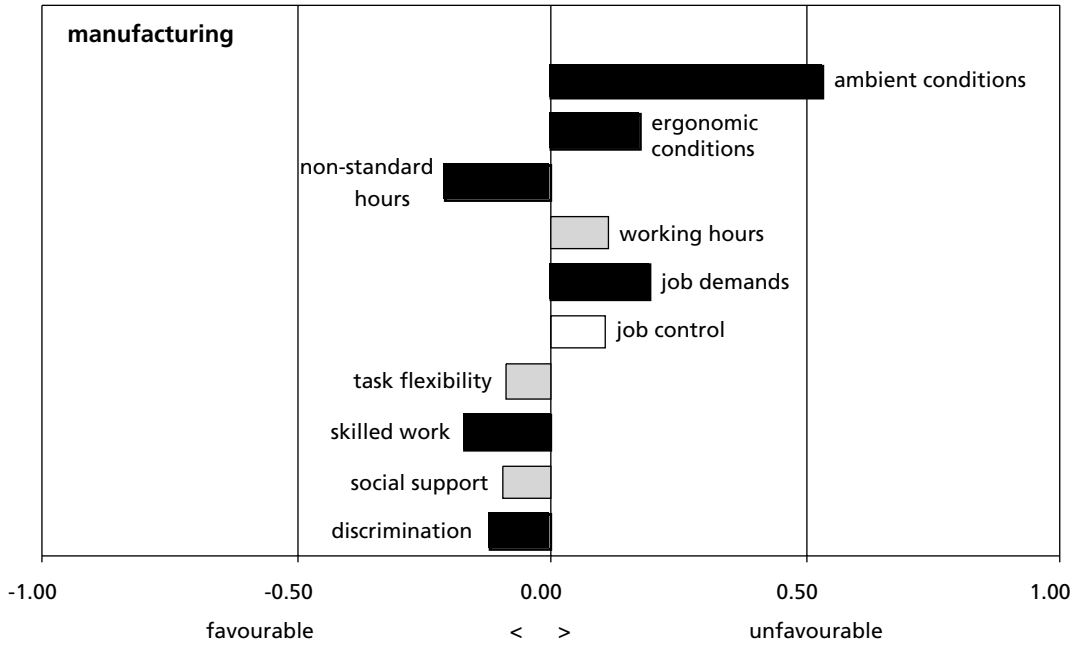
>
unfavourable


manufacturing
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
0.50
1.00
favourable
<
>
unfavourable


public utilities
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
0.50
1.00
favourable
<
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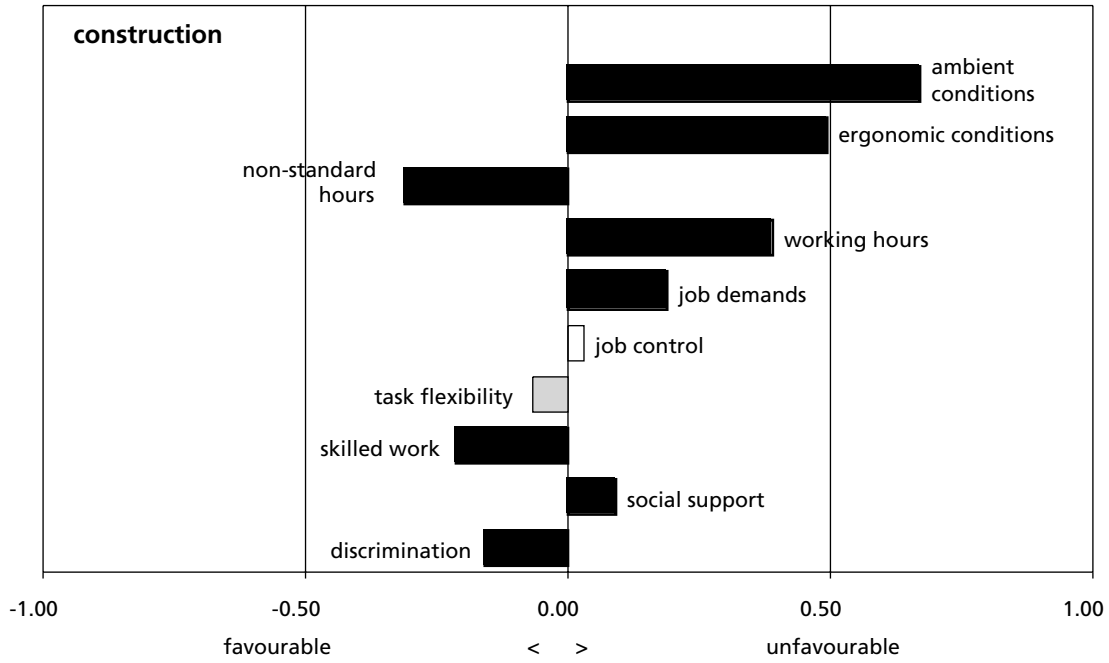
unfavourable


construction
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
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1.00
favourable
<
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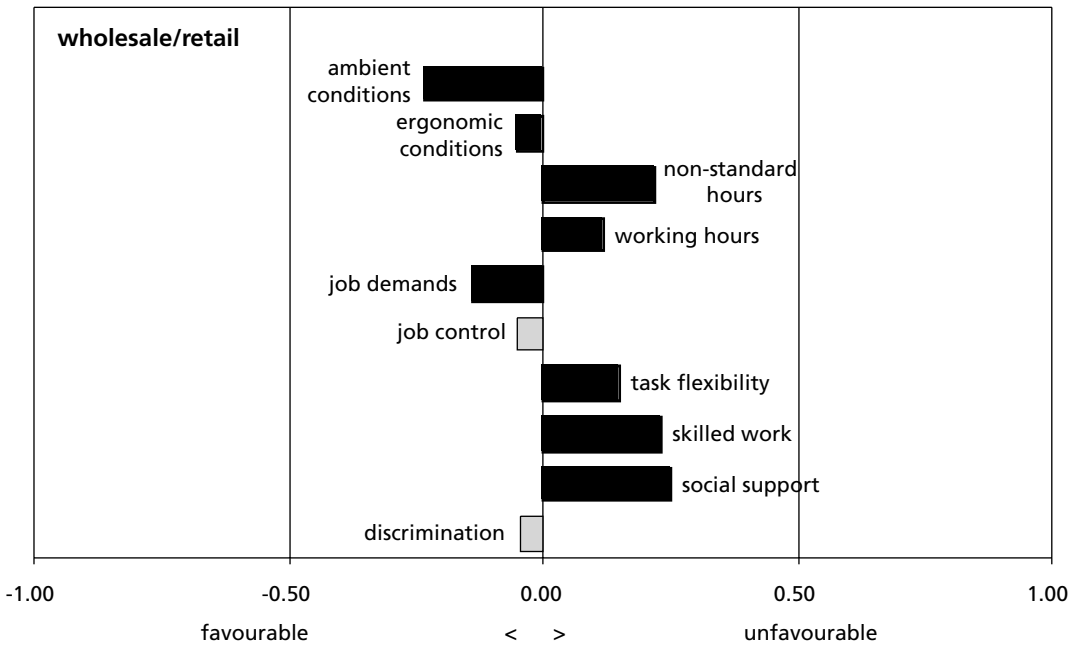
unfavourable


wholesale/retail
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
0.50
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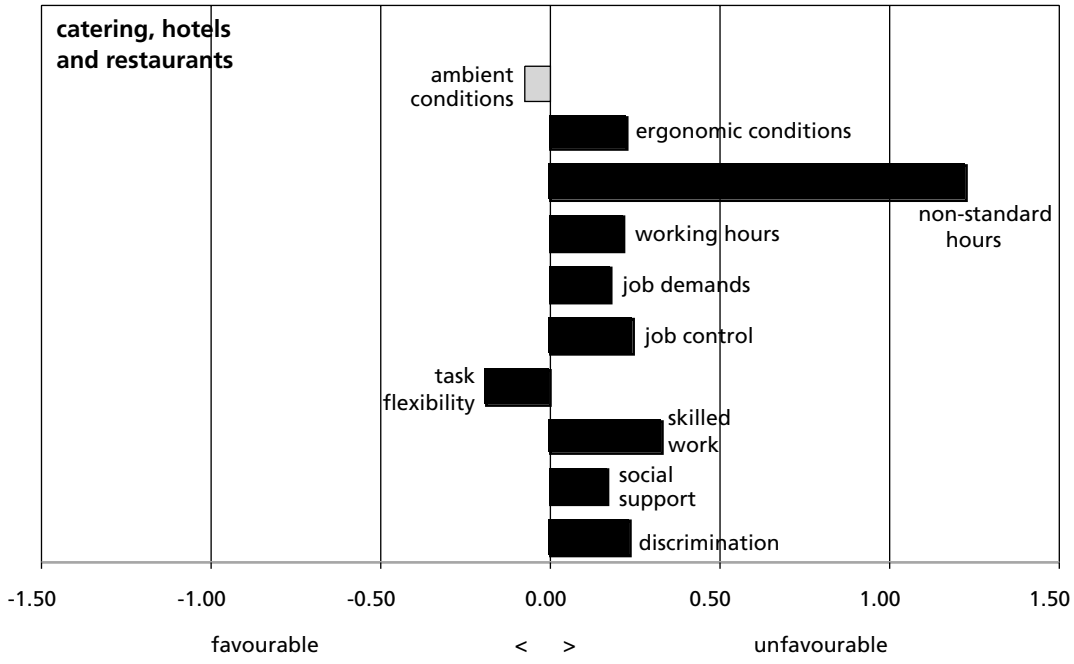
favourable
<
>
unfavourable


catering, hotels and restaurants
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.50
-1.00
-0.50
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favourable
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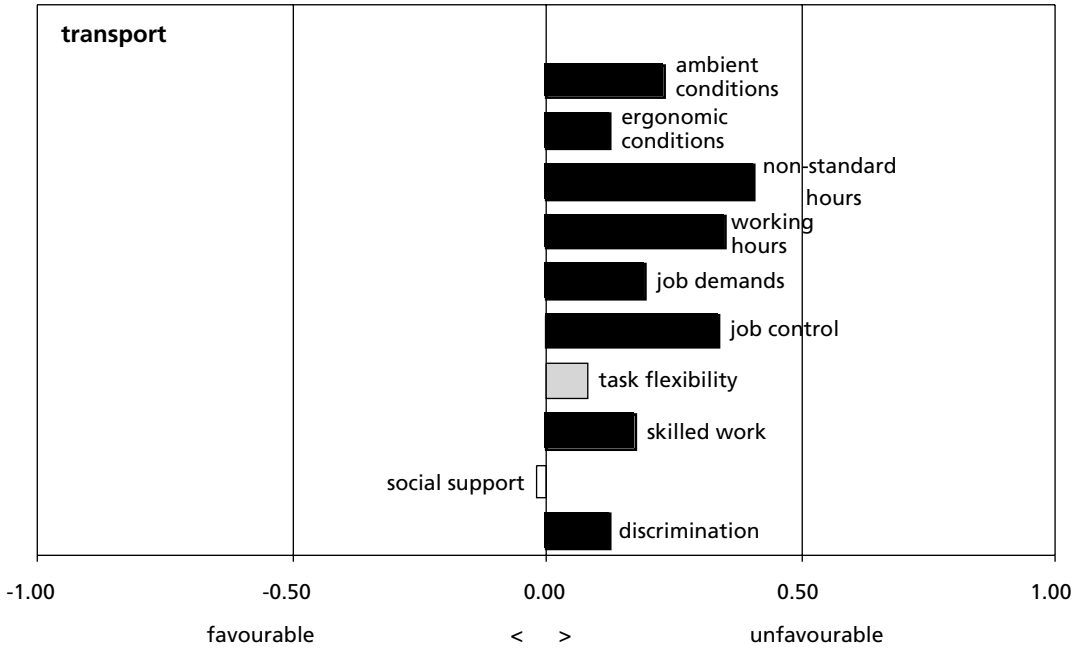
unfavourable


transport
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
-1.00
-0.50
0.00
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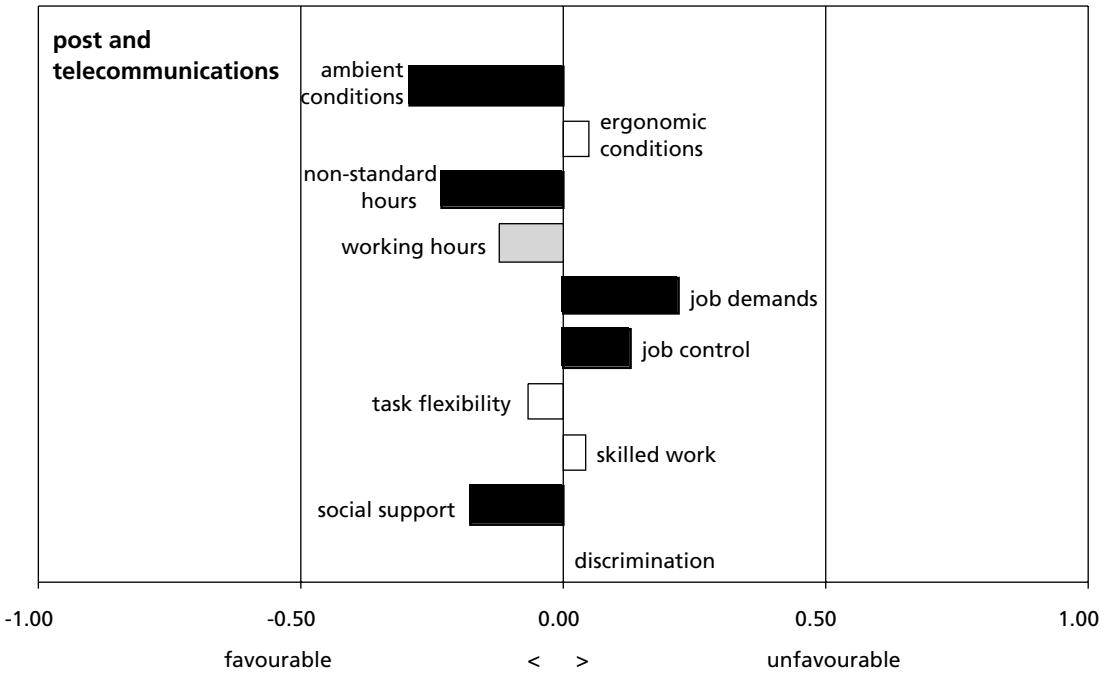
1.00
favourable
<
>
unfavourable


post and telecommunications
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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favourable
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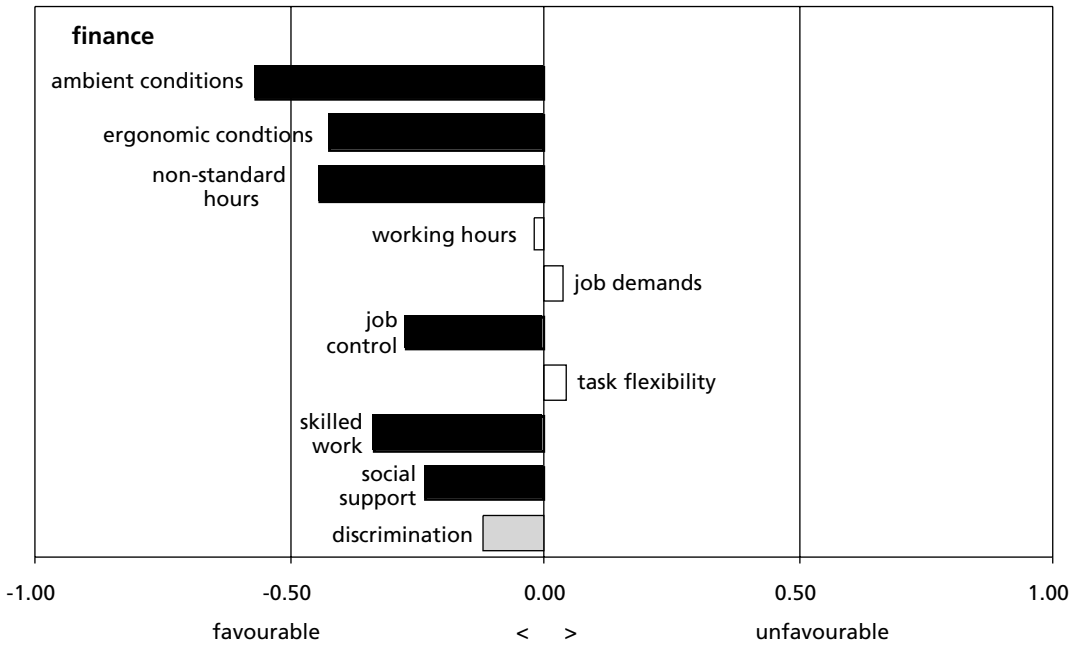
unfavourable


finance
ambient conditions
ergonomic condtions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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favourable
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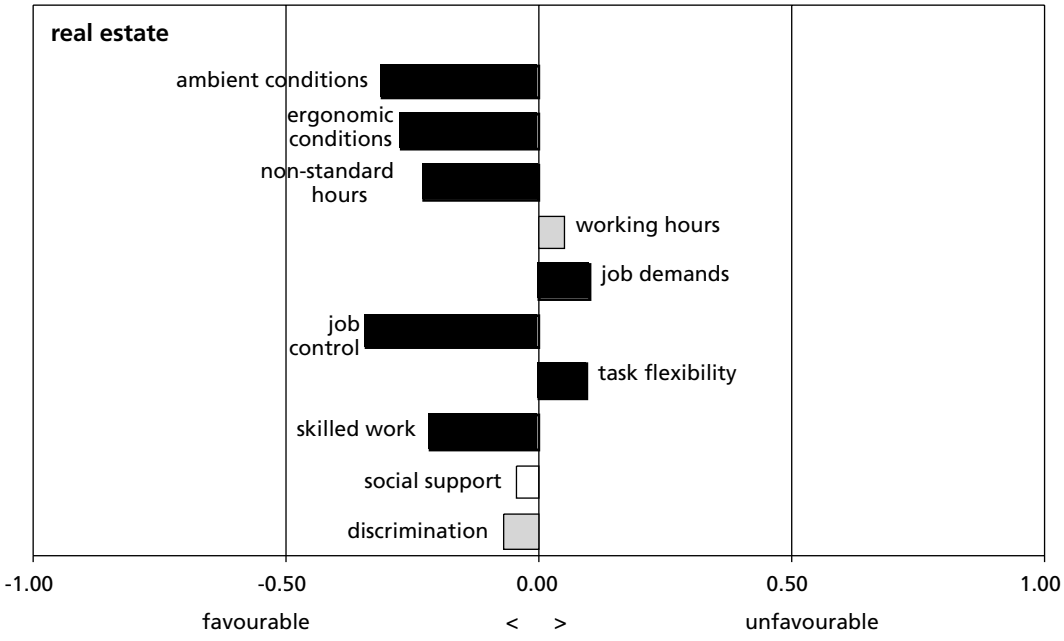
unfavourable


real estate
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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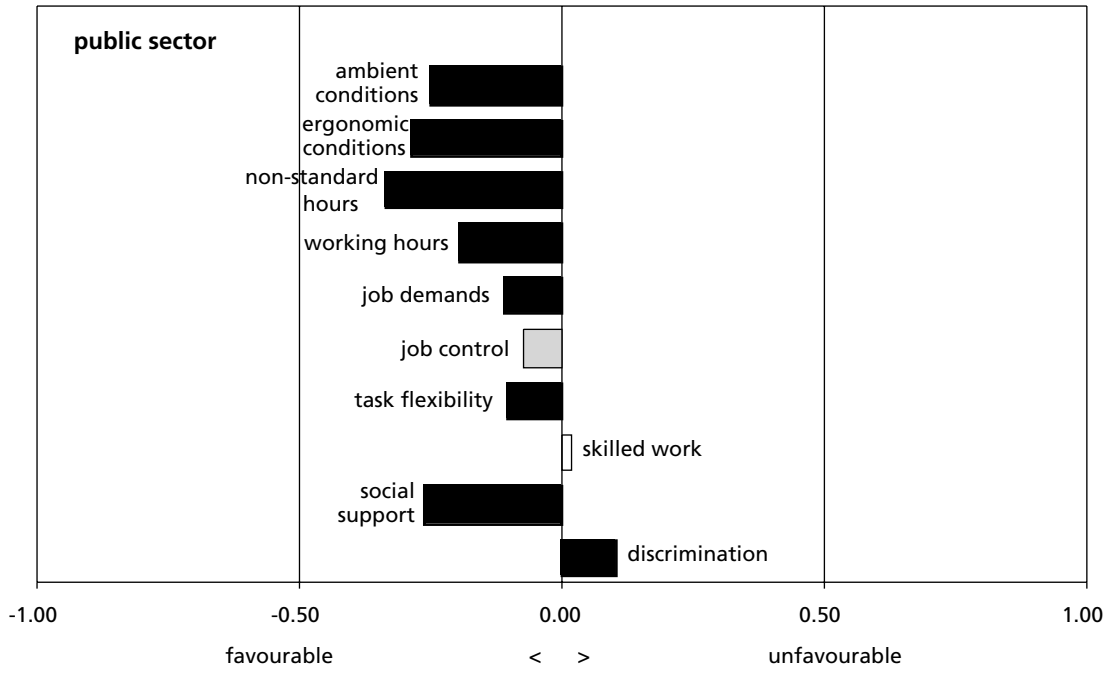
public sector
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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0.00
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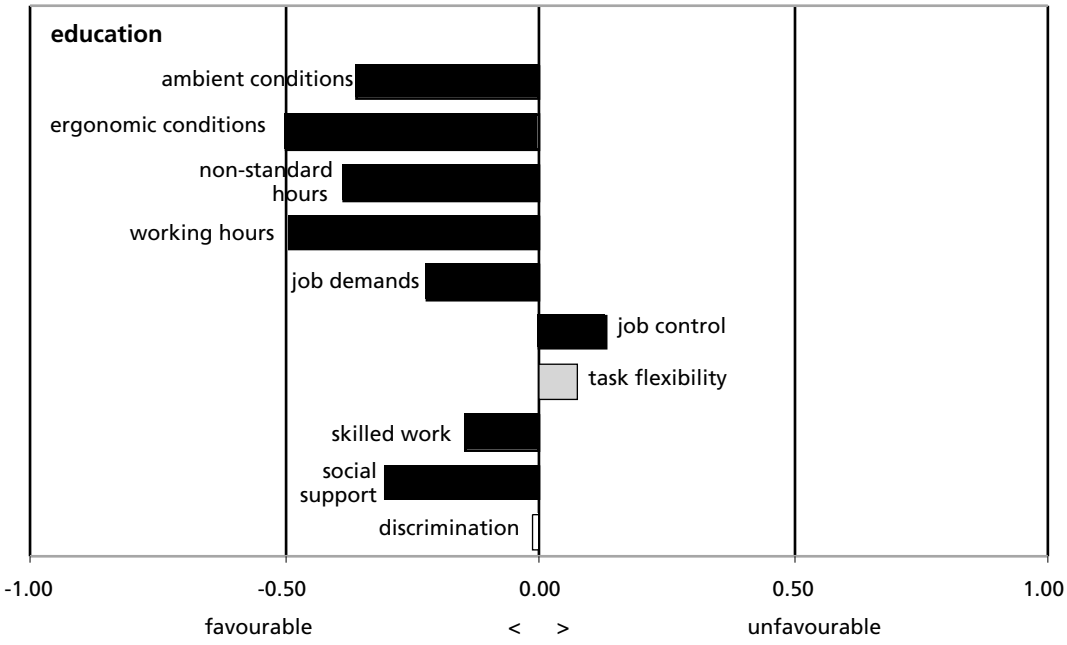
1.00
favourable
<
>
unfavourable


education
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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favourable
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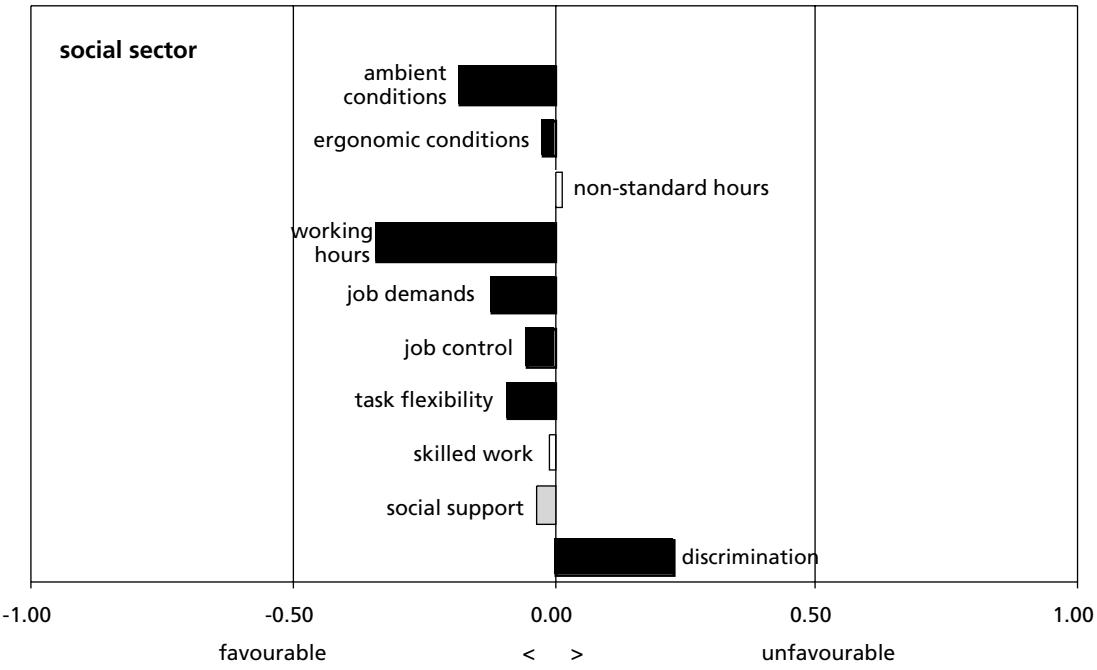
unfavourable


social sector
ambient conditions
ergonomic conditions
non-standard hours
working hours
job demands
job control
task flexibility
skilled work
social support
discrimination
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0.50
1.00
favourable
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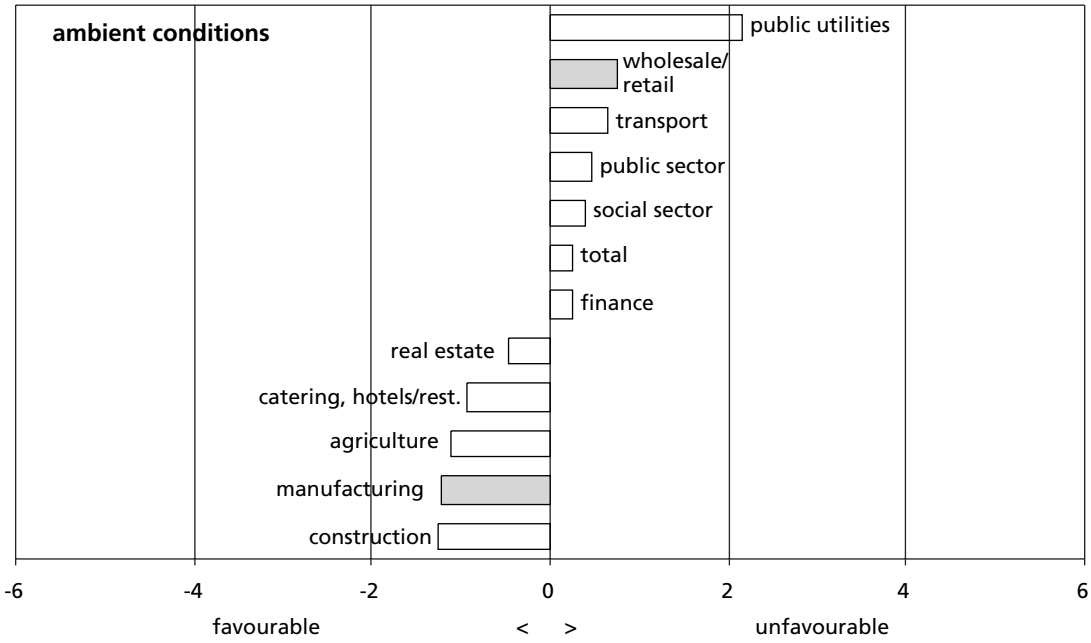
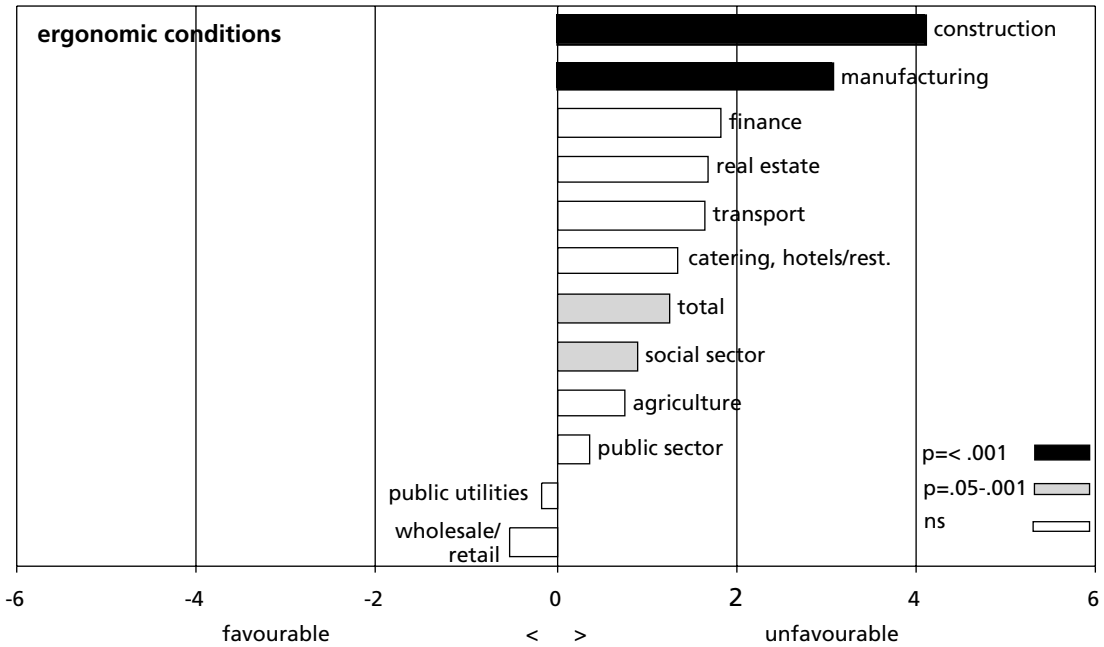
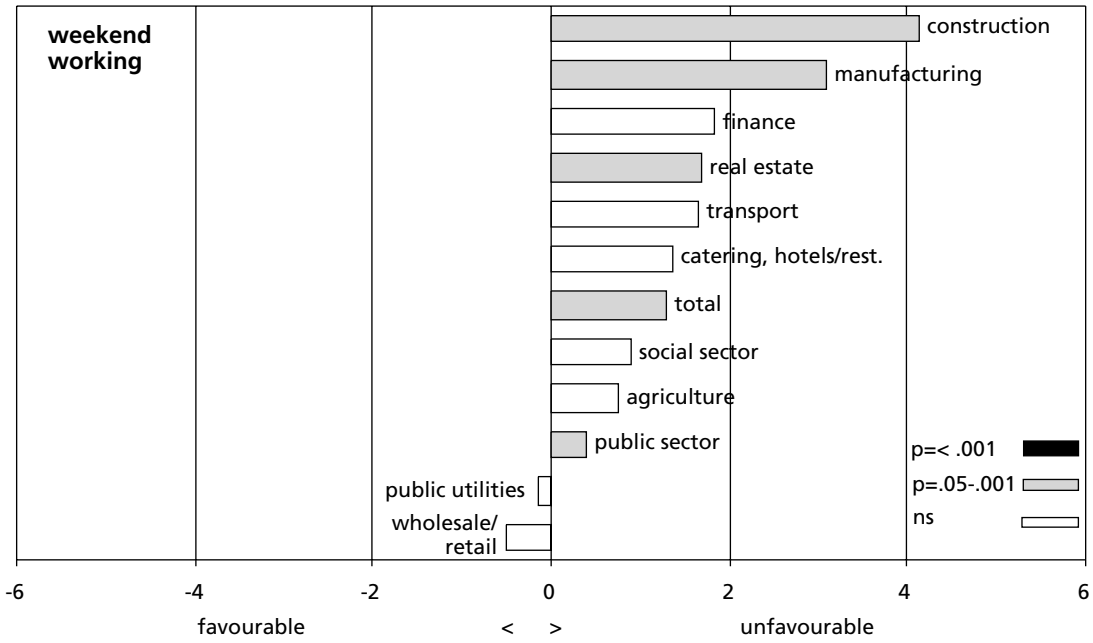
unfavourable

Appendix 8
Graphical presentation of changes in working conditions by sector






weekend working
construction
manufacturing
finance
real estate
transport
catering, hotels/rest.
total
social sector
agriculture
public sector
public utilities
wholesale/ retail
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-4
-2
0
2
4
6
favourable
<
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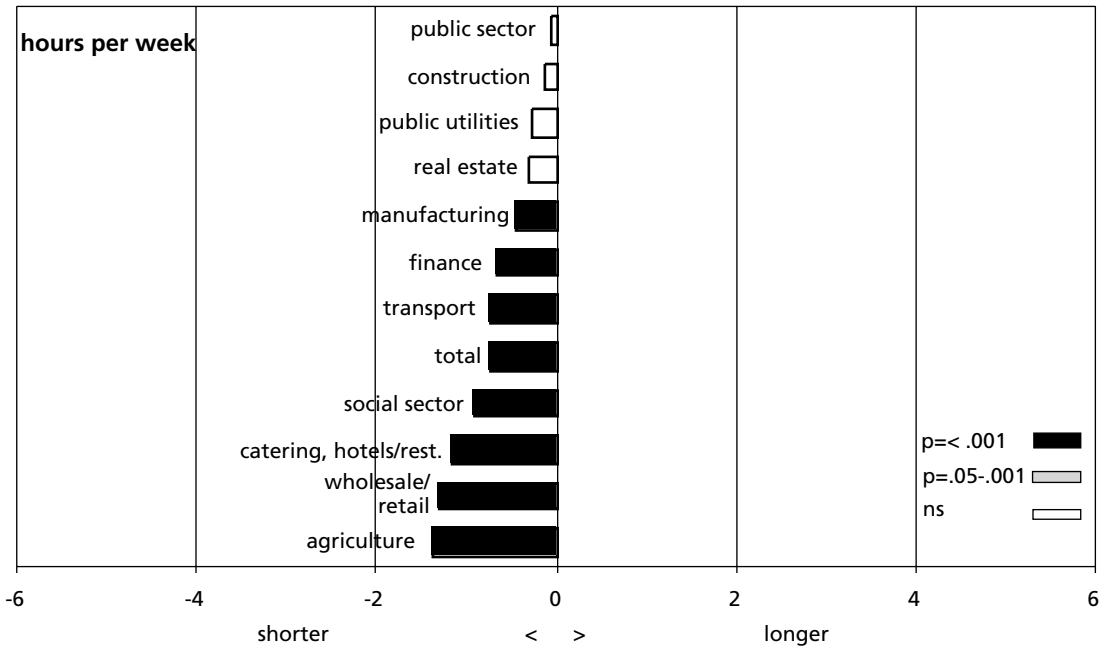
unfavourable


hours per week
public sector
construction
public utilities
real estate
manufacturing
finance
transport
total
social sector
catering, hotels/rest.
wholesale/ retail
agriculture
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p=.05-.001
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-2
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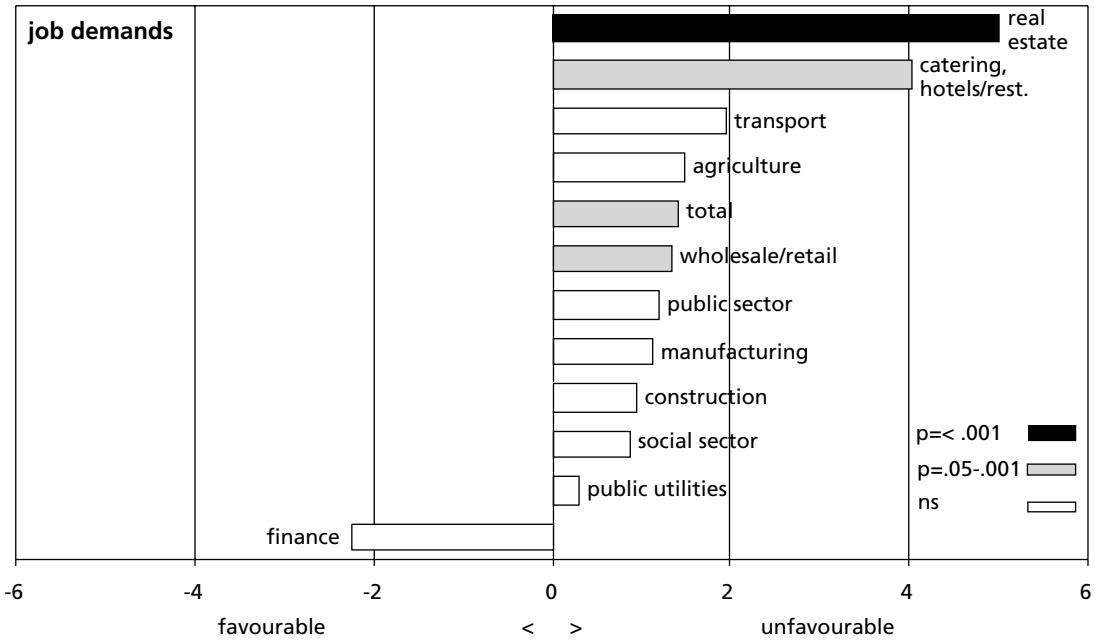
2
4
6
shorter
<
>
longer


job demands
real estate
catering, hotels/rest.
transport
agriculture
total
wholesale/retail
public sector
manufacturing
construction
social sector
public utilities
finance
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-2
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4
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favourable
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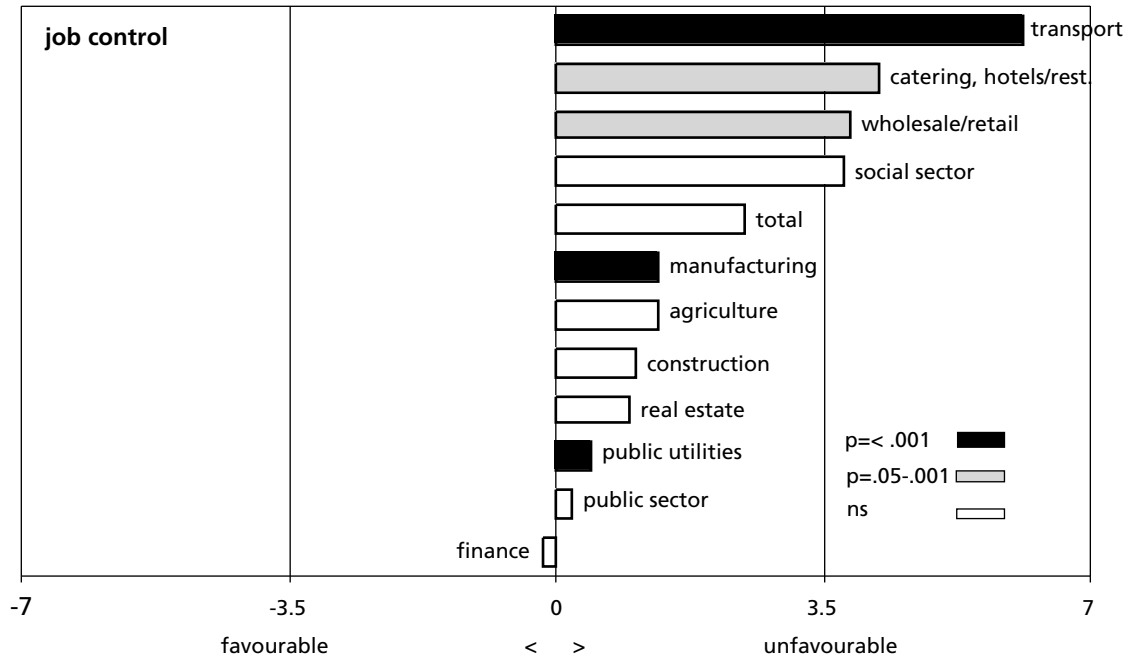
unfavourable


job control
transport
catering, hotels/rest.
wholesale/retail
social sector
total
manufacturing
agriculture
construction
real estate
public utilities
public sector
finance
p=< .001
p=.05-.001
ns
-7
-3.5
0
3.5
7
favourable
<
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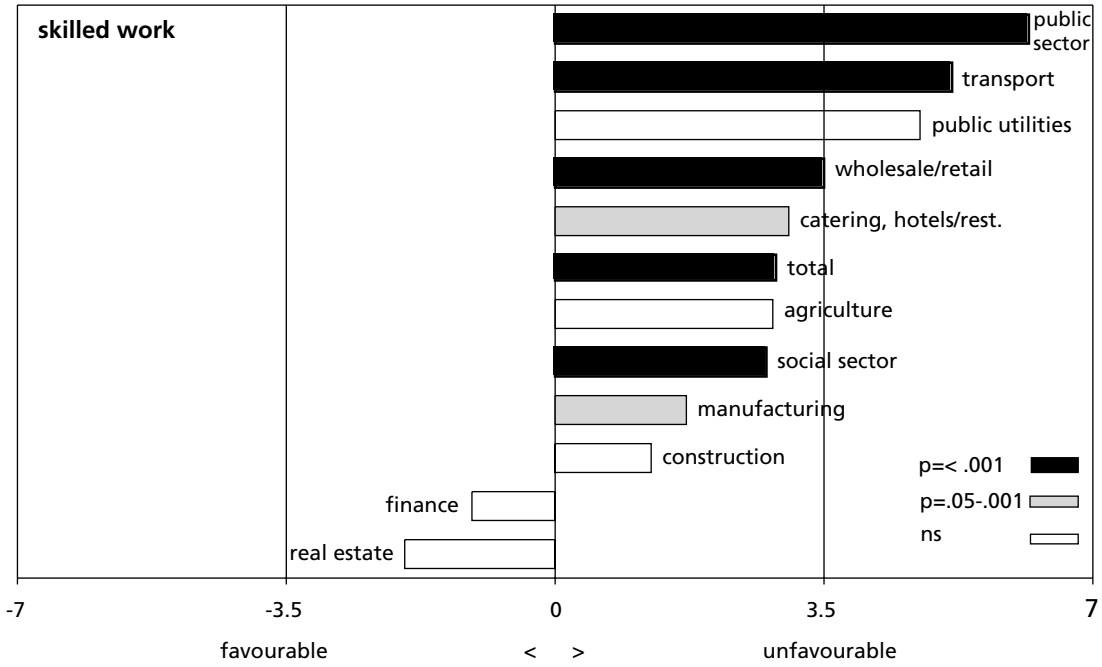
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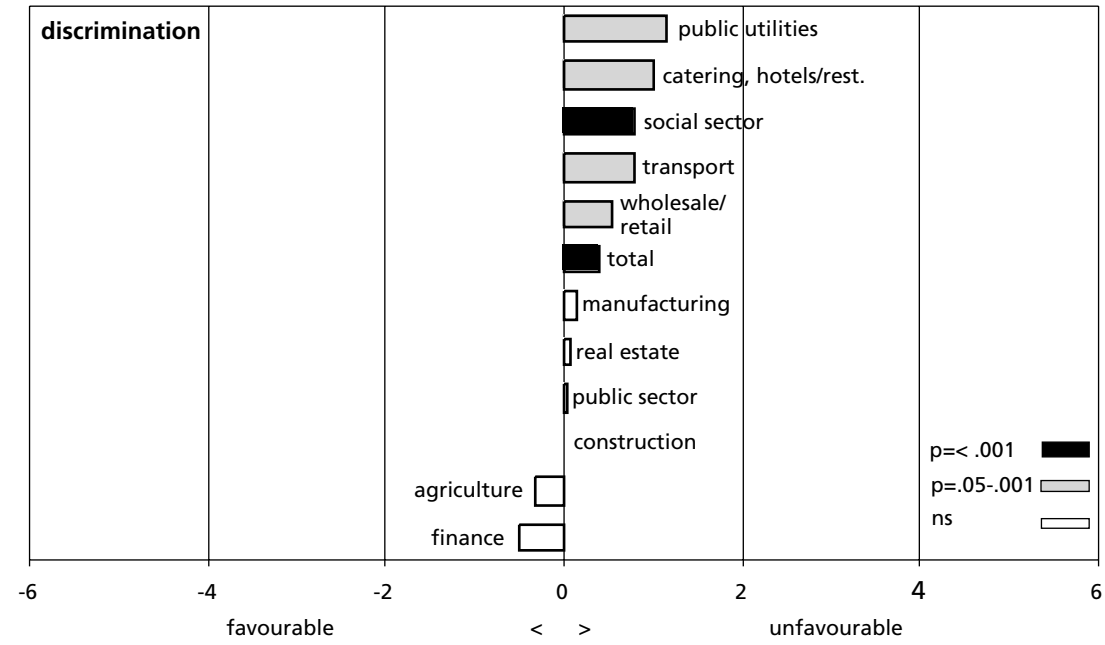
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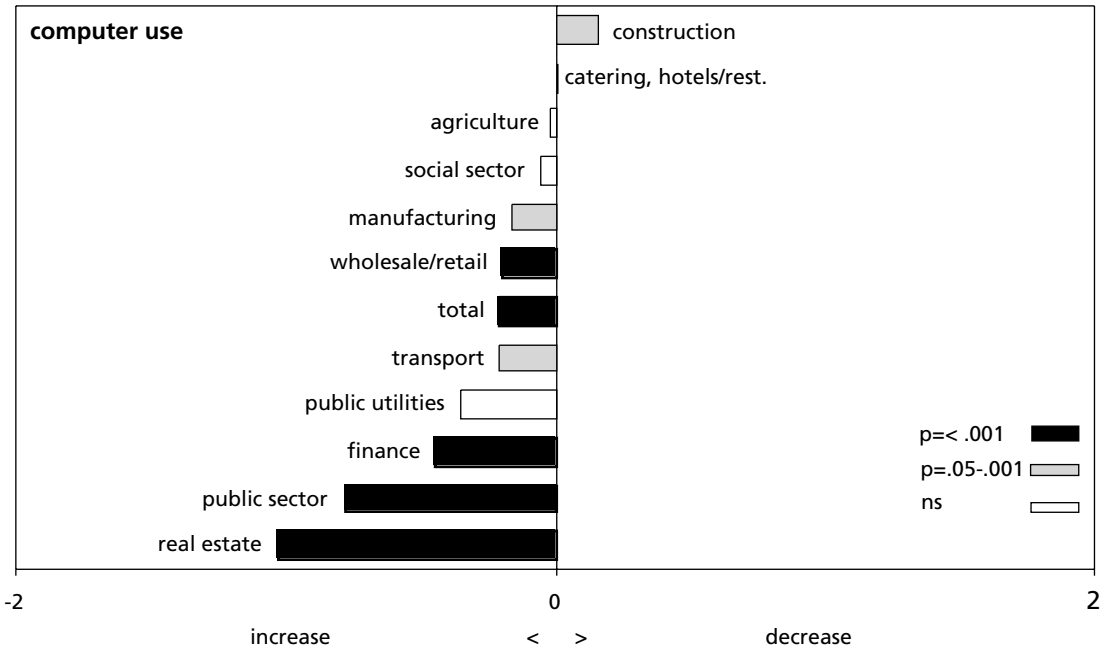
computer use
construction
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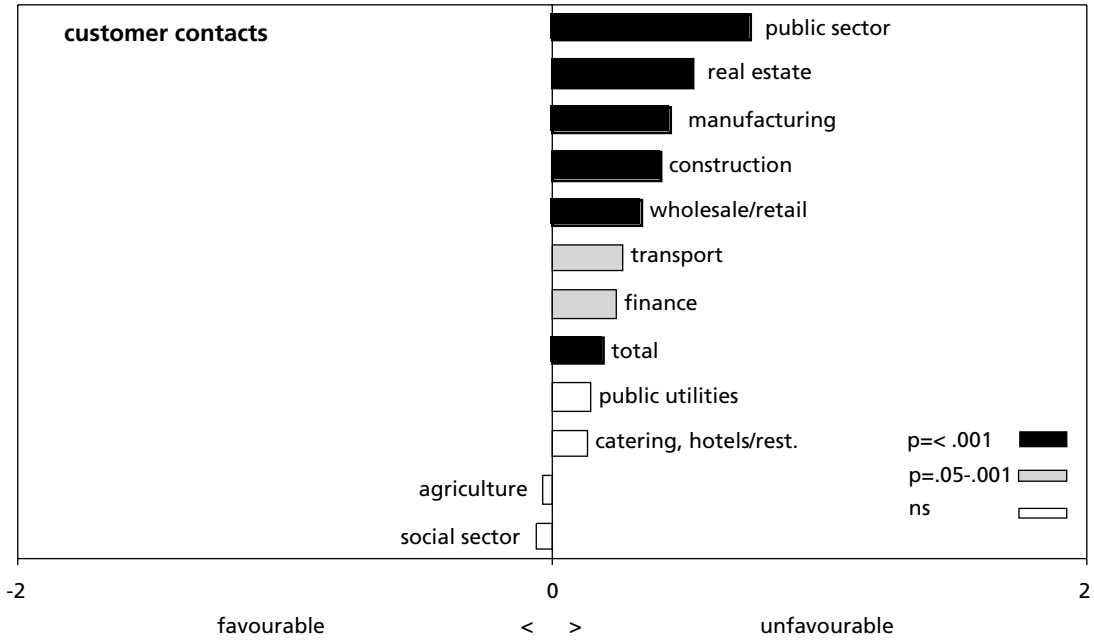
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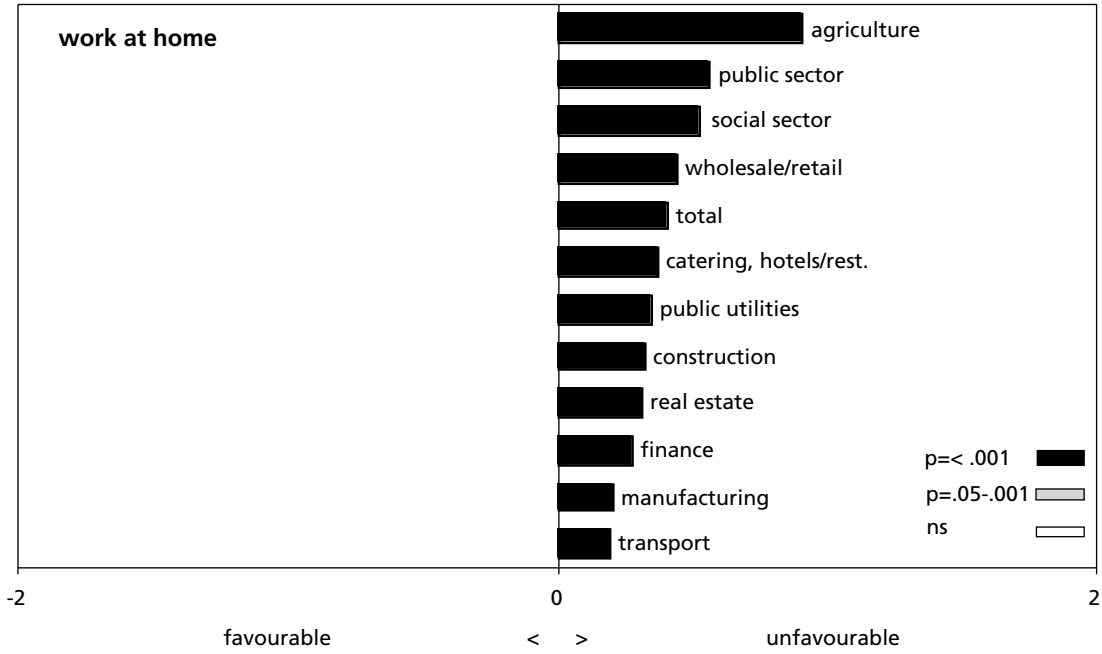
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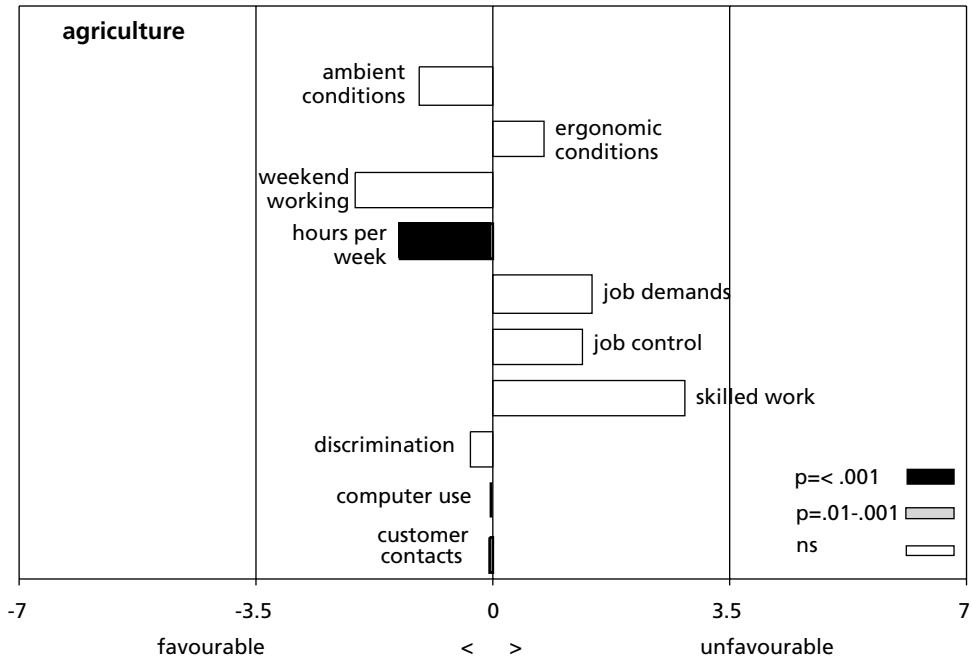
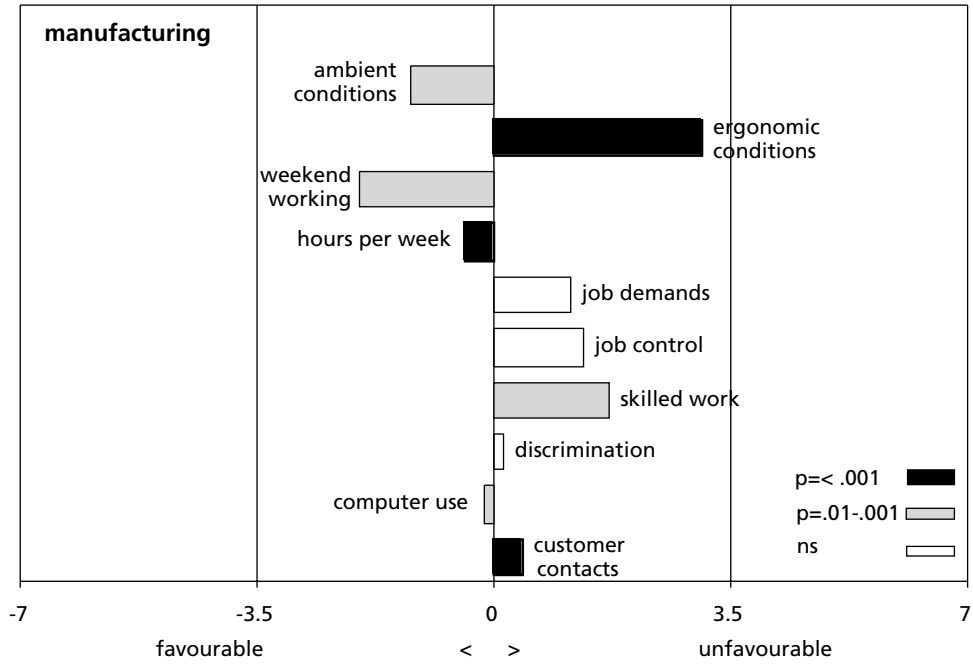
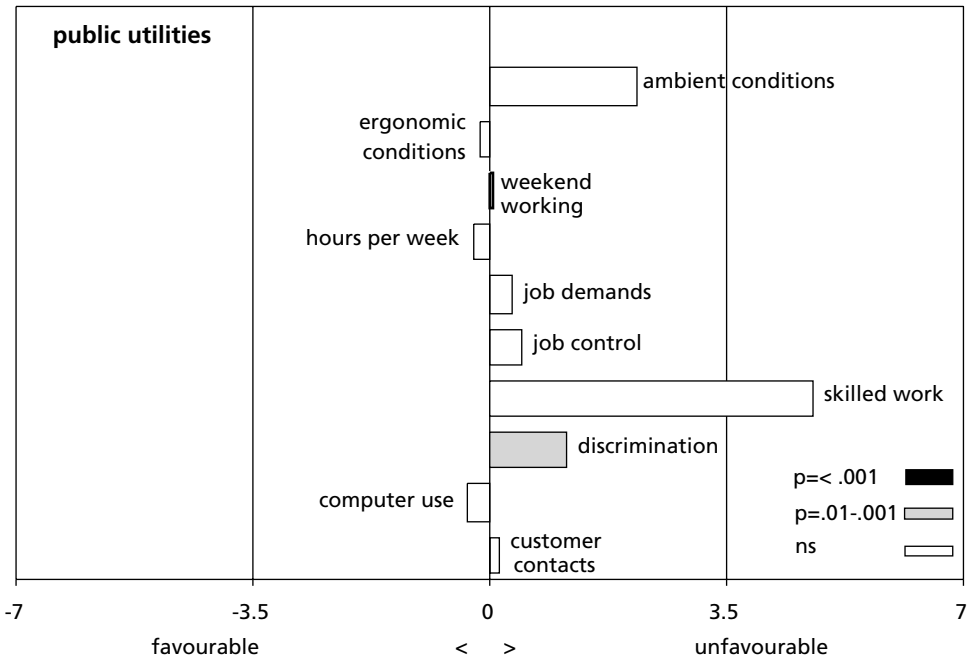
Appendix 9
Graphical presentation of changes in sector profiles



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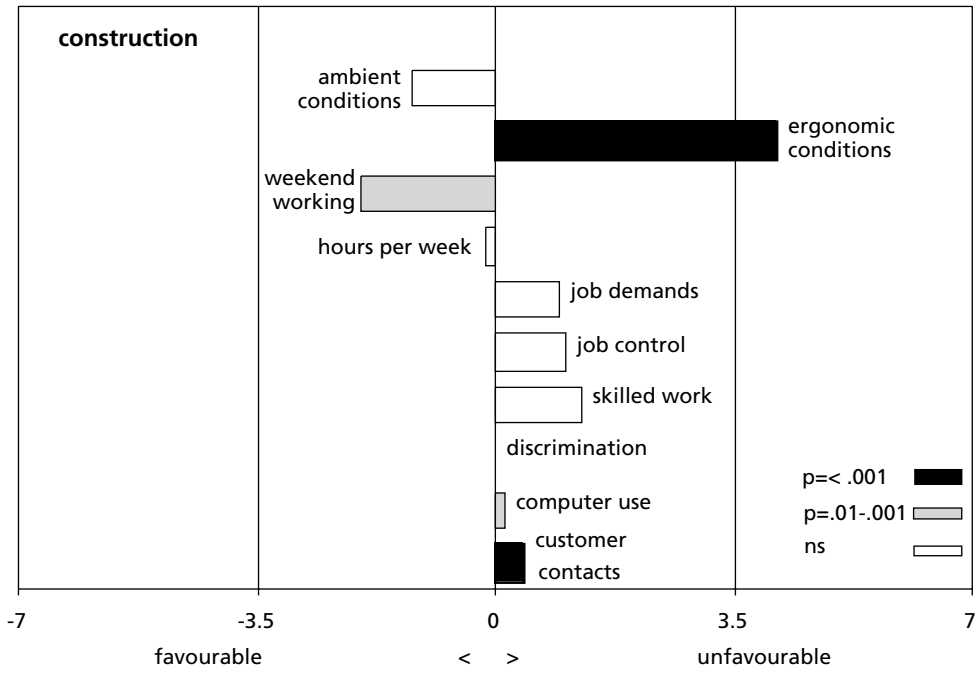
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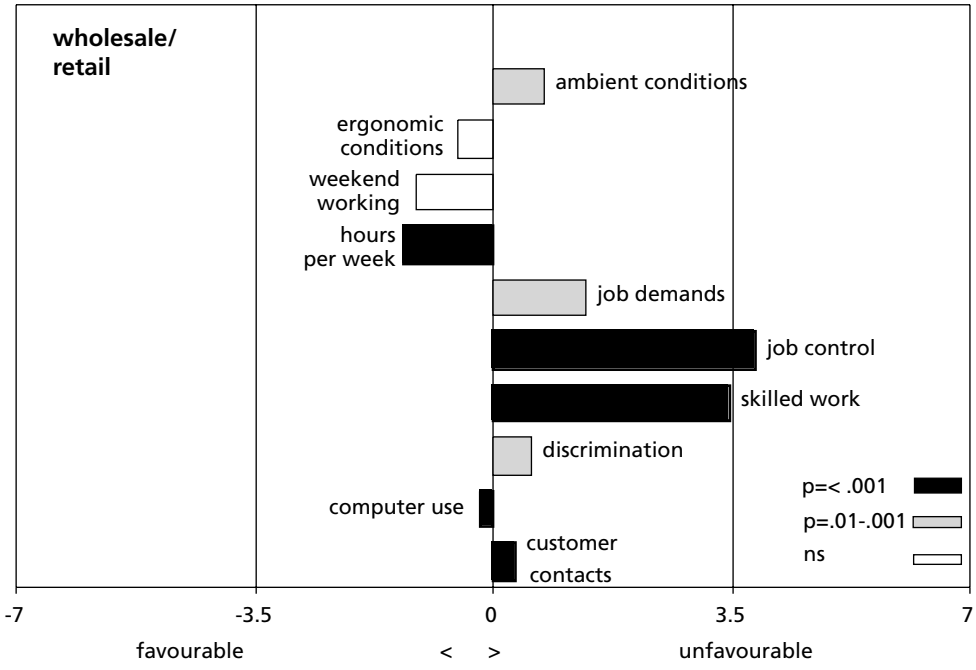
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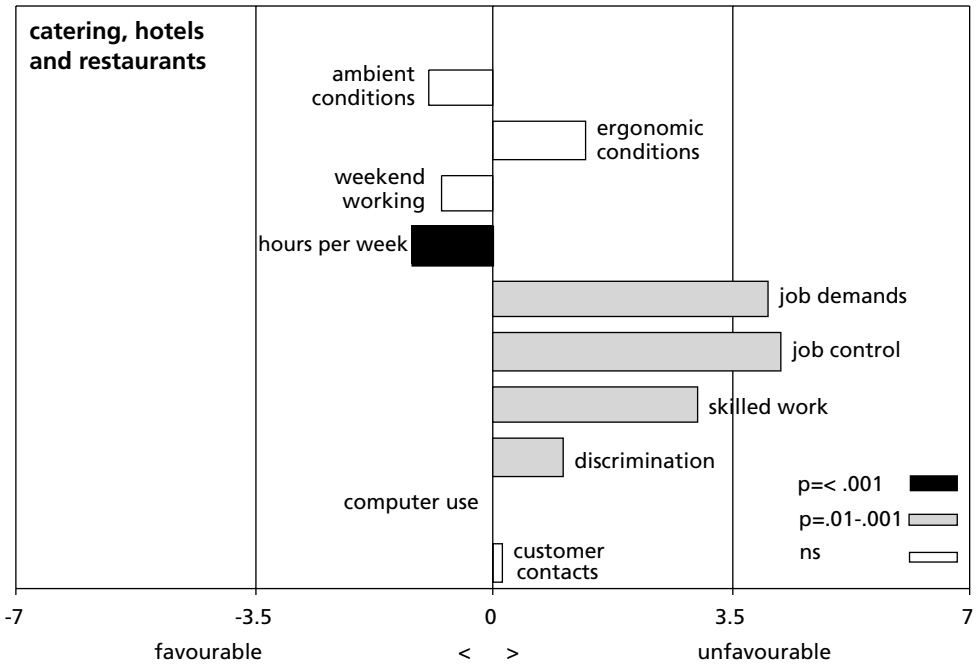
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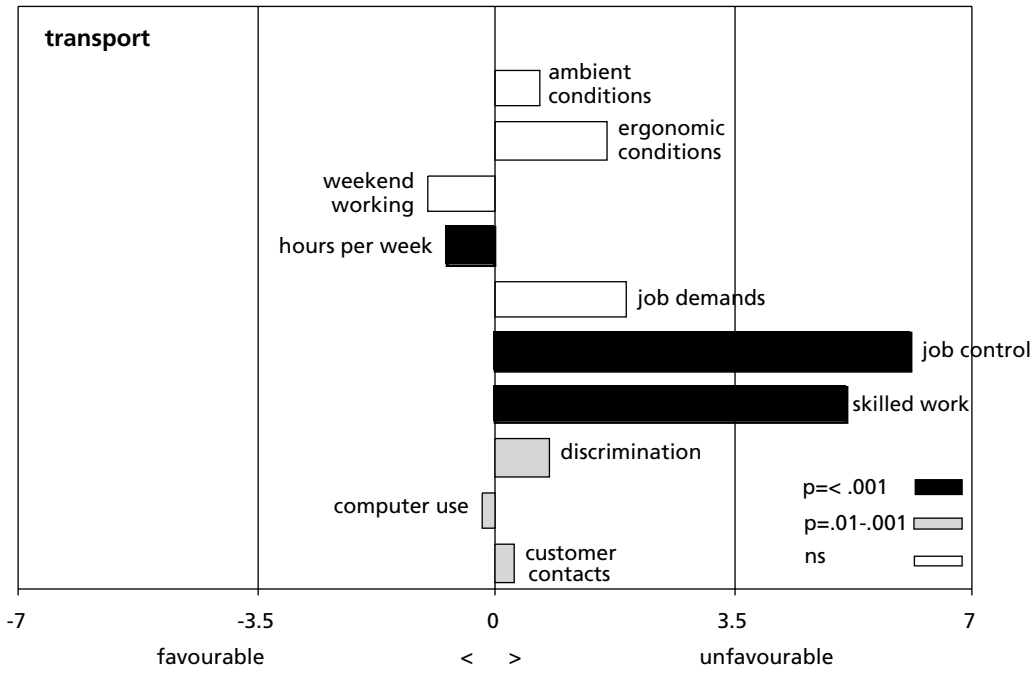
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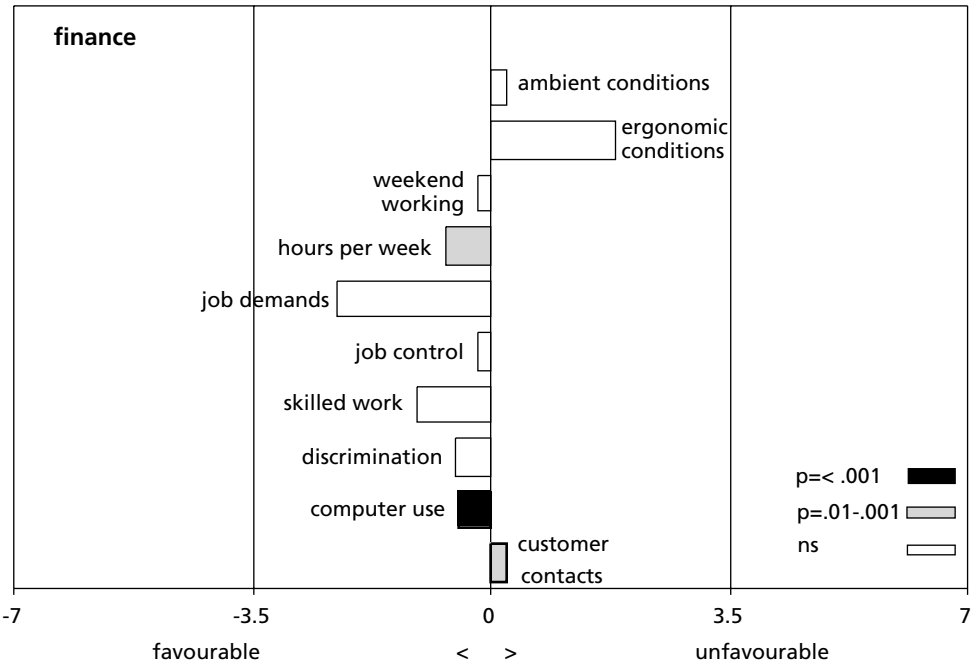
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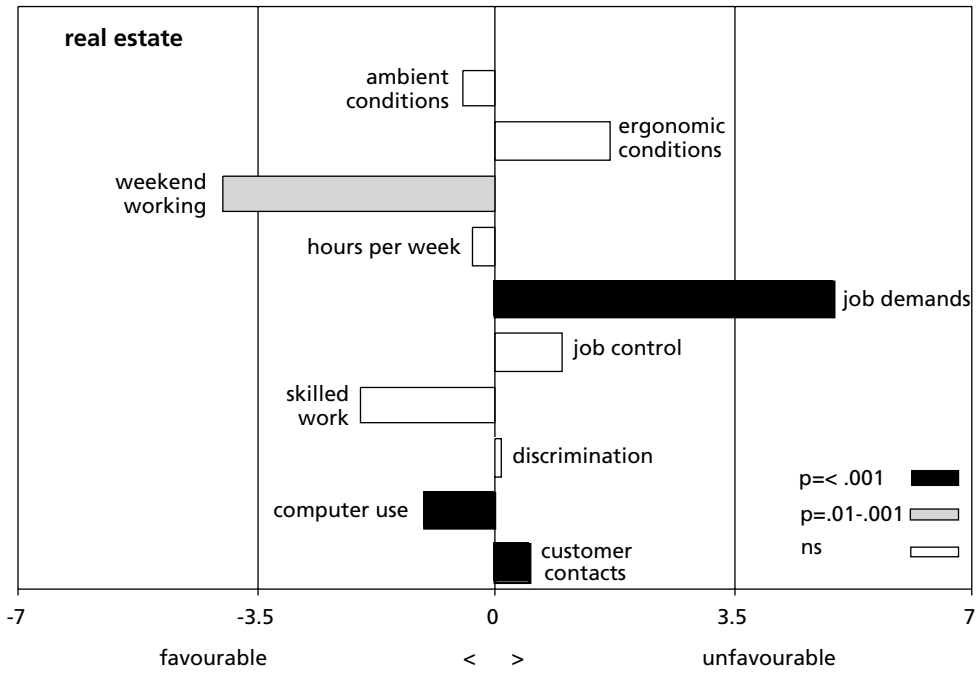
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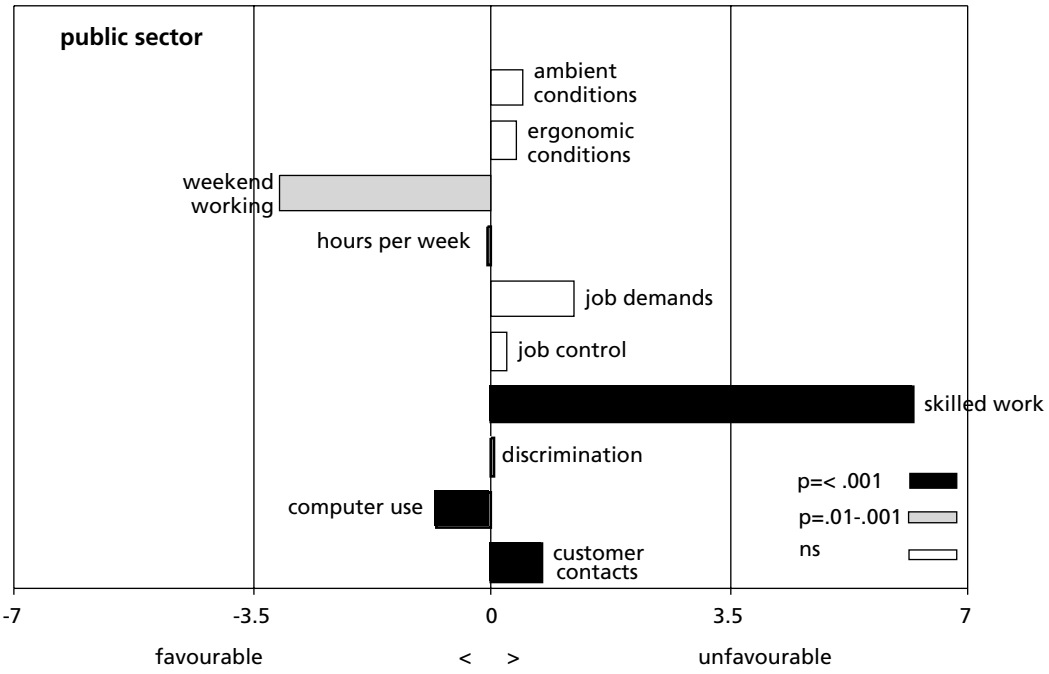
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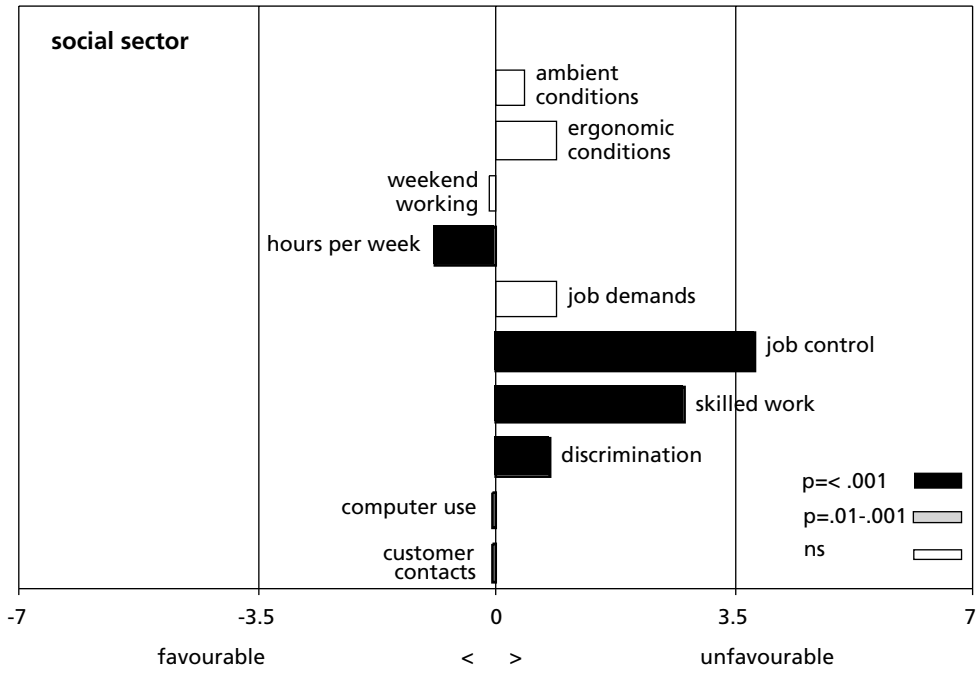
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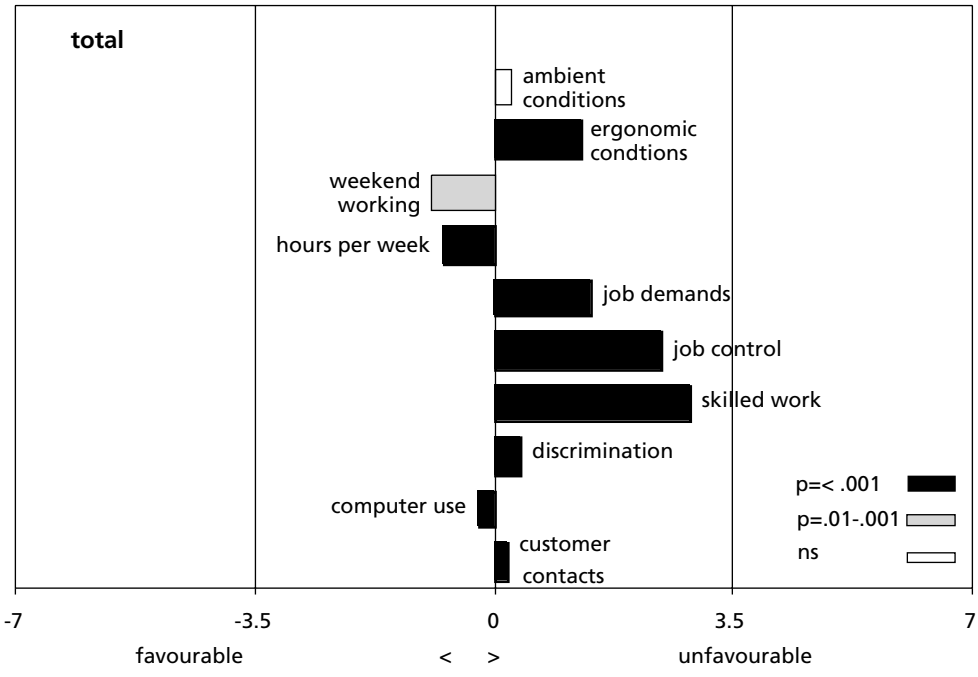
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Appendix 10
Sector rankings

Sector rankings in several national data sets and the EF2000 survey[1]

→ size<20		**NOISE**			**SPEED**		**HEAVY**	
0		ED	ND	→ size<200	ED	ND	ED	ND
Germany		Manufacturing	Construction		Catering	Construction	Construction	Construction
	→	Construction	Manufacturing		Construction	Transport	Catering	Catering
	→	Transport	Transport		Transport	**Post and telecom**	**Transport**	Manufacturing
	→	Catering	Catering		Manufacturing	Manufacturing	Manufacturing	Wholesale/retail
		Wholesale/retail			**Post and telecom**	Catering	Wholesale/retail	**Transport**
		Social sector	Public sector		Wholesale/retail	Public sector	Social sector	Social sector
	→	Public sector	**Wholesale/retail**		Public sector	Social sector	Public sector	Public sector
	→	Post and telecom	Post and telecom		Social sector	Wholesale/retail	Post and telecom	Post and telecom
Spain	→	Construction	Manufacturing		Catering	Post and telecom	Construction	Construction
		Manufacturing	Construction		Transport	**Social sector**	**Transport**	Wholesale/retail
	→	Transport	Transport	→	Post and telecom	Catering	Manufacturing	Manufacturing
	→	**Catering**	**Public sector**		**Manufacturing**	Transport	Wholesale/retail	**Social sector**
		Social sector	Social sector		Construction	Public sector	Catering	**Transport**
	→	**Public sector**	Wholesale/retail		**Social sector**	Wholesale/retail	**Social sector**	Catering
		Wholesale/retail	**Catering**		Public sector	**Manufacturing**	Public sector	Public sector
		Post and telecom	Post and telecom		Wholesale/retail	Construction	Post and telecom	Post and telecom
Neth	→	Construction	Manufacturing		Catering	Catering	Construction	Construction
		Manufacturing	Construction		Construction	**Post and telecom**	Catering	Catering
	→	Catering	Catering		Transport	**Social sector**	Wholesale/retail	Wholesale/retail
	→	Transport	Transport		**Wholesale/retail**	Construction	**Social sector**	Manufacturing
		Social sector	Social sector		**Post and telecom**	Transport	Manufacturing	Transport
		Wholesale/retail	Wholesale/retail		**Social sector**	**Wholesale/retail**	Transport	**Social sector**
		Post and telecom	Public sector		Manufacturing	Public sector	Post and telecom	Public sector
	→	Public sector	Post and telecom		Public sector	Manufacturing	Public sector	Post and telecom
UK		Manufacturing	Manufacturing		Catering	Catering	Construction	Construction
	→	Construction	Construction	→	Construction	Construction	**Manufacturing**	Wholesale/retail
	→	Catering	**Transport**		Manufacturing	Manufacturing	Wholesale/retail	Transport
	→	Public sector	Catering	→	**Transport**	Public sector	Transport	**Manufacturing**
	→	**Transport**	Public sector	→	Post and telecom	Post and telecom	Social sector	Social sector
		Social sector	Social sector		Public sector	Wholesale/retail	Catering	Catering
		Wholesale/retail	Wholesale/retail		Wholesale/retail	**Transport**	Public sector	Public sector
	→	Post and telecom	Post and telecom		Social sector	Social sector	Post and telecom	Post and telecom

[1]Sectors in **bold**: more than one ranking place apart in European and National data.
Sectors with → (column NOISE) have a sample size n< 200 in the TNO-report.

Sector ranking – Finland

		NOISE			SPEED			HEAVY		
		ED		ND	ED		ND	ED		ND
Finland		Manufacturing		Manufacturing	Catering		Catering	Construction		Catering
	→	Construction		Construction	**Construction**		Transport	Catering		Construction
	→	Catering		Catering	Wholesale/retail		**Social sector**	**Wholesale/retail**		**Social sector**
	→	Transport		Transport →	Transport		Public sector	Manufacturing		Manufacturing
		Social sector		Social sector →	Manufacturing		Wholesale/retail	Transport		**Wholesale/retail**
	→	Wholesale/retail		Wholesale/retail	Post and telecom		Manufacturing	**Social sector**		Transport
		Post and telecom		Public sector	**Social sector**		**Construction**	Public sector		Public sector
	→	Public sector		Post and telecom →	Public sector		Post and telecom	Post and telecom		Post and telecom

In this supplement the sector rankings on several working conditions in the most recent national data sets (ND) are compared to the sector rankings per country in the European Survey data set 2000 (ED). Since the EF2000 survey only has 1500 workers per country in their sample, and the national data sets are not that large either, sample sizes can become quite small. Small sample sizes mean that the reliability of the sector information on the working conditions is not that great. When the sample size per sector is smaller that n = 200, this is indicated in the first columns (on noise, but they also apply to the other information on that sector in that data set) as an arrow. When sample sizes of EF2000 are smaller than 200, this is indicated at the left of the sector labels. When sample sizes in national data sets are smaller than 200, this is indicated at the right of the sector labels.

When sectors differ more than one ranking between the EF2000 data and the national data, the sector labels are put in **bold**.

European Foundation for the Improvement of Living and Working Conditions

Sectoral profiles of working conditions

Luxembourg: Office for Official Publications of the European Communities

2002 – XIII, 70 pp. – 21 x 29.7 cm

EF/02/75/EN

This report looks at trends in working conditions across different sectors over a five-year period 1995-2000. Basing its findings on the Third European Survey on Working Conditions carried out by the Foundation in 2000 in the 15 EU Member States and Norway, it examines the quality of working life in eighteen different sectors. It analyses the impact of aspects such as physical risks, working hours, and work organisation on the worker's health and well-being. Factors contributing to a favourable or unfavourable work and psychosocial environment include the level of job pressures, control over one's work, skills matching and learning opportunities, task flexibility, and social support from colleagues and boss. The report concludes that in general the most negative changes are an increase in job demands, resulting in work-related stress, and a general deskilling and decrease in job control.

The European Foundation for the Improvement of Living and Working Conditions is a tripartite EU body, whose role is to provide key actors in social policy making with findings, knowledge and advice drawn from comparative research. The Foundation was established in 1975 by Council Regulation EEC No 1365/75 of 26 May 1975.

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