

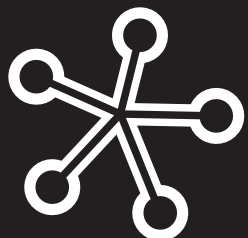


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Advanced labour Studies

# Working time flexibility components of companies in Europe

*Heejung Chung, Kea Tijdens*

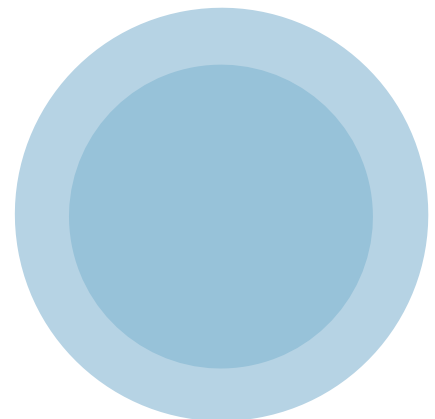
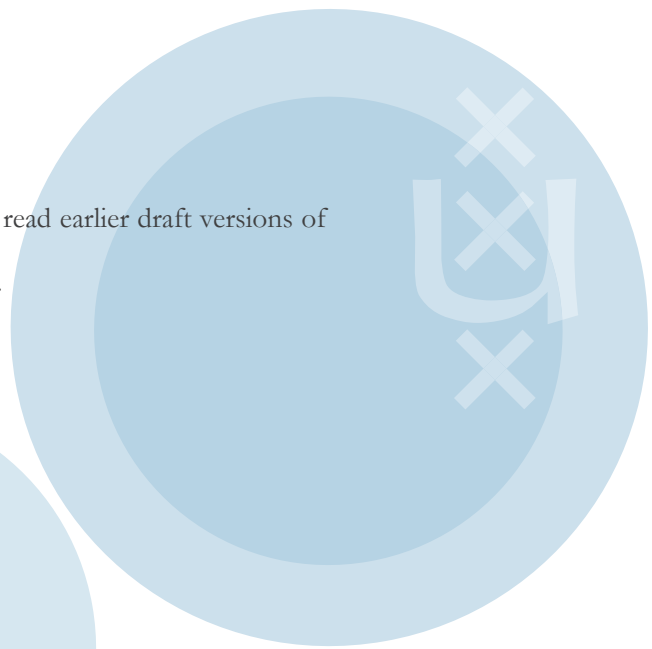
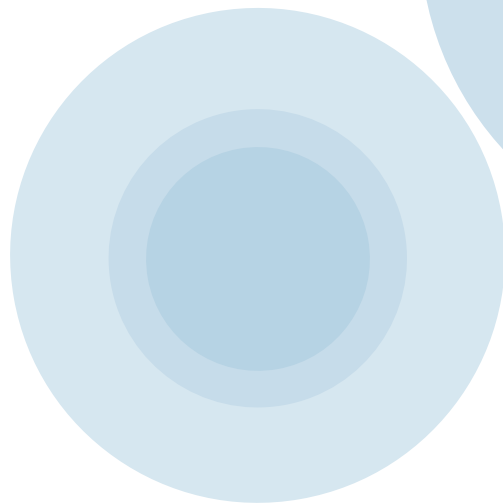


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# **Working time flexibility components of companies in Europe**

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**WP 09/84**



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# Abstract

Working time flexibility comprises a wide variety of arrangements, from part-time, overtime, to long-term leaves. Theoretical approaches to grouping these arrangements have been developed, but empirical underpinnings are rare. This paper investigates the bundles that can be found for various flexible working time arrangements, using data of the Establishment Survey on Working Time (ESWT), 2004/2005, covering 21 EU member states and 13 industries. Using factor analyses, the results confirmed that working time arrangements can be grouped into two bundles, one for the employee-centred arrangements, a second for the employer-centred arrangements, and that these two bundles are separate dimensions. We have also tested the stability of the factor analysis outcome, showing that although there are some deviations from the pan-Europe and pan-industry outcome, the naming of the components as flexibility for employees and flexibility for employers can be interpreted as holding rather stable. Lastly, we also find that there are three country clusters that can be found for the 21 European countries using the bundle. The first group consisting of the Northern European countries with Poland and Czech Republic, the second group the continental European countries with UK and Ireland, and lastly, the southern European countries with Hungary and Slovenia.

Key words: flexible working time arrangements, company survey, cross-national study, latent components, working time regimes





# 1. Introduction

Many studies in the area of Human Resource Management (HRM) talk about various categories of flexibility strategies used within companies (for example, Atkinson and Meager, 1986; Cappelli and Neumark, 2001). In addition, an increasing number of studies talks about flexicurity components found in Europe (for example, CEC, 2007; Philips and Eamets, 2007). Comparatively, few studies investigate the dimensions of working time flexibility. Most studies have been restricted to the examination of one arrangement, usually the use of part-time work (O'Reilly and Fagan, 1998, Anxo et al., 2007), the actual hours worked (example O'Reilly et al., 2000; Messenger, 2004), or employees' working time preferences (Stier and Lewin-Epstein, 2003; Bielenski et al., 2005).

In other words, although there have been many studies on working time, not many studies examine empirically whether and how working time arrangements occur simultaneously within companies. However, such a holistic approach is important for several reasons. Firstly, examining the separate use of flexible arrangements neglects how organisations may use various combinations of arrangements in combination (Kalleberg et al, 2003: 539) due to the substitution and complementary relationships between the arrangements. Secondly, the use of bundles captures the basic distinction between types of flexible arrangement, since sometimes managers may not strictly distinguish between the different types (Kalleberg et al 2003: 539~540). Lastly, the use of the concept of bundles or components allows a much simplistic analysis of complex ideas, since we are able to grasp the use of various arrangements in manageable small number of concepts.

Regardless, although many studies have developed assumptions about the bundling of a wide variety of working time arrangements, empirical underpinnings using large numbers of cases across countries are absent. This is most likely due to the lack of appropriate data sources, thus data covering the wide range of issues on working time flexibility, collected at establishment-level, comparable across different countries, and due to the lack of a method in which the arrangements can be examined simultaneously. This paper has overcome these problems, using large-scale, multi-country establishment data and factor analyses

This paper asks the question whether working-time flexibility arrangements can indeed be grouped as bundles based on the practices of companies across Europe and if so, what types of bundles can be identified? Thus, what the main latent factors (characteristics) are underlying the groupings of working time flexibility arrangements used in companies in Europe? In addition, it examines the relationship between the

bundles, thus if we could find a dichotomous relationship, or some correlations between them. The theoretical basis of the analysis is the flexible firm approach, which takes a holistic view of companies' practices and thus a focus on the combinations of flexible practices. Lastly, the paper examines the different country clusters that can be found using this approach of using working time components. This is done to test if the concepts found do show meaningful results in the cross-national level. The empirical underpinning of this paper stems from the European Working Time Survey (ESWT) 2004/2005, conducted by the European Foundation. In this paper, we put forward a new method in which we examine flexible working time arrangements as bundles, not as separate entities.

The paper is structured as follows. In the next section, we examine the some theories of various working time flexibility categories and working time regime typologies to derive our hypothesis. In the third section, we examine the ESWT data, the method used, namely factor analysis and cluster analysis, and the grounds for the choice of variables included in the analysis. In section four, we provide the outcomes of the factor analysis and test its robustness across countries and sectors. In addition, also in this section we examine the country clusters found using the components found in the previous analysis and compare the results to the existing working time regime studies. In section five, we draw conclusions.

## 2. Working time categories or strategies

### 2.1. Flexible working time typologies

Until now, there were no studies that provided empirical analysis that derived working time components that can be applicable to companies across Europe. However, there are studies that theoretical distinguish dimensions or typologies of working time arrangements. Most of these studies distinguish between employer- and employee-preferred flexibility arrangements, though the terminology varies greatly. Worker-centred flexibility versus company-centred flexibility (Gareis and Korte, 2002), active versus passive flexibility (Wilthagen, 1998; Visser, 2003), employer-oriented versus employee-oriented arrangements (Reilly, 2001; Rubery and Grimshaw, 2003), and unstructured, structured and autonomous flexibility (Fagan, 2004) are working time flexibility categories developed over the years.

Despite the differences in their wording, most typologies distinguish between flexibility serving employees' needs and those which are for employers' needs. Gareis and Korte (2002: 1104), for example, define worker-centred flexibility as involving "more freedom to choose working times attuned to personal preferences and family requirements". On the other hand, company-centred flexibility "brings supply of human capital in line with the temporal requirements following from business, e.g. times of customer demand, machine running times, optimal utilisation of capital invested" (Gareis and Korte, 2002: 1104). Similarly, Wilthagen (1998) and Visser (2003) put forward the notion of active versus passive flexibility based on the voluntariness of take up. When the employer imposes flexibility on the worker, it is considered passive. If workers voluntarily take up an arrangement based on their preferred working conditions, this is considered active.

Fagan (2004) expands this distinction even further by including the predictability dimension into account. Using the notion of structured and unstructured flexibility as developed by Purcell et al. (1999), she distinguishes three types of working time flexibility strategies. Unstructured flexibility is when employees have little control over the schedule and the volume of hours that they work, similar to employer-oriented flexibility. Autonomous flexibility is geared towards employees' needs rather than organizational requirements and gives employees some ability to vary or alter their working time in order to accommodate other activities, similar to employee-oriented flexibility. The third category is structured flexibility. Here, the working time arrangements are non-standard, but predictable, offering employees more control over their work-

ing hours than unstructured flexibility, and potentially providing an alternative for people who cannot work standard hours (Fagan, 2004: 111). This distinction could be considered a type of flexibility that facilitates the needs of both employers and employees.

The only competing theory against the predominant employer versus employee-oriented dimensions is the part-time versus full-time oriented working time arrangements typology. In the case of Rubery and Grimshaw (2003), they consider this as an additional dimension, thus putting forward a two-dimensional approach of working time, employer- versus employee-orientation dimension and the part-time versus full-time dimension.

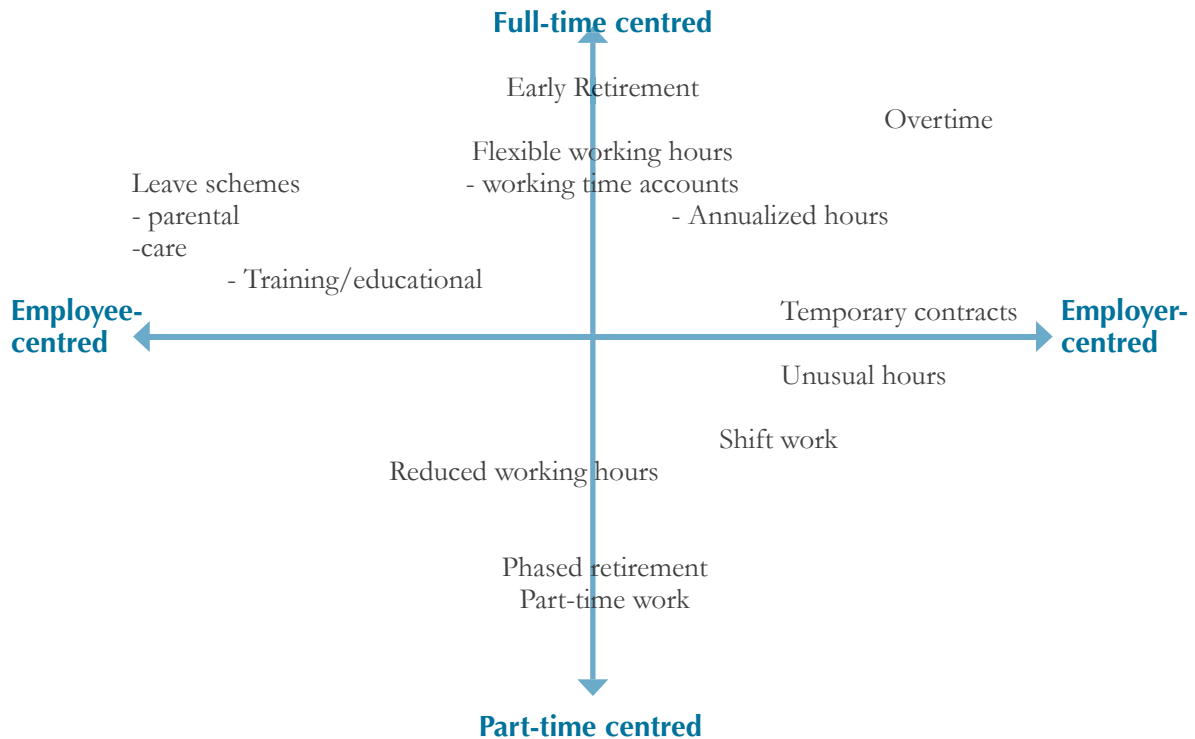
Regarding the typologies of working-time flexibility, two schools of thoughts can be distinguished. Visser (2003) and Rubery and Grimshaw (2003) understand the employee- versus employer-orientation of the arrangements as one linear continuum with employer-orientation at one end and employee-orientation at the other. In other words, the more employee-centred an arrangement is, automatically the less employer-centred it is, and vice versa. In contrast, Fagan (2004) and Gareis and Korte (2002), present the dimensions rather as dichotomous entities. Here, the degree to which the flexibility arrangements facilitate the needs of either the employee or the employer is not necessarily at odds with each other, and there can be arrangements where both needs are met.

Most of the above mentioned studies have based their arguments on a theoretical basis or on a small number of empirical case studies from one or a few countries. Thus, our understanding of working time flexibility and its dimensions could benefit largely from a broader empirical underpinning.

## **2.2. The dimensions of working time flexibility**

From the literature examined in the previous section, we derived three approaches to working time flexibility. In the first, two continuums can be assumed to position all flexible working time arrangements, notably the full-time/part-time divide and the emphasis on employer or employee-centred interests, as is shown in figure 1.

Figure 1. Taxonomy of flexibility arrangements



Source: Based on Rubery and Grimshaw (2003), Visser (2003) adapted by authors

In the graph part-time work, phased retirement, and the right to reduce working hours are considered as part-time related arrangements, whereas early retirement and flexible working hours are more likely to be arrangement used in tandem with full-time contracts. However, all of these arrangements can be seen as having the potential to serve the interests of both employees and employers, meeting the needs of both sides. Additionally, working time accounts can be seen as being more employee-centred, whereas annualization of working hours is likely to be more geared towards the employer. Despite having similar characteristics, working time accounts have been developed to facilitate workers balancing work and life, whereas annualization of working hours is used to allow employers to change employees' daily/weekly working hours to adapt to workload cycles without having to pay overtime premiums.

Leave schemes are employee-centred flexibility arrangements which are also mostly full-time oriented. Although leave schemes can be used by part-time workers, they are used more often as alternatives to reduction of working hours for adapting work to various life needs such as child-minding duties. Overtime, temporary contracts and unusual hours are more employer-centred options. Of these, overtime is used more in the full-time centred model, whereas unusual hours and temporary contracts can be used by both full-time and part-time models. Shift work is more employer-centred and oriented more towards the part-time centred flexibility model. Both dimensions form a linear continuum.

The second approach assumes that the part-time versus full-time oriented dimension is not a relevant dimension. This could also be depicted as Figure 1, however, when the dimension of part-time, full-time is excluded from the picture, and only the linear continuum of the dimension with employer-orientation and employee-orientation exists.

In both approaches, employer and employee-centred characteristics are placed on linear continuums. This presumes that the placement of arrangements along the horizontal axis represents on one hand whose utility the arrangements provide, but at the same time the disutility they provide to the other party. When an arrangement is placed at the right end of the spectrum as an employer-oriented arrangement, like overtime, it is automatically seen as providing negative utility for employees, and *visa versa*. In addition, the arrangements placed in the middle of the continuum can be considered to provide utility for both sides, but not as much as the ones at the either ends of the spectrum.

Unlike the second approach, the third approach assumes that the employee- and employer-centred characteristics of working time arrangements form two different dichotomous dimensions, as shown in table 1. The dimensions are, firstly, whether or not the working time arrangement facilitates the needs of employees, and secondly, whether or not it facilitates the needs of employers. Based on these two dimensions, three categories of working time flexibility can be distinguished. The first category refers to working time flexibility arrangements for employees, which includes various leave schemes such as parental leave, long-term leave for care, education, training, and leave for other reasons. The second category points to working time flexibility arrangements for employers, including shift work, night shifts, weekend shifts, and overtime. Lastly, there are working time flexibility arrangements that facilitate both sides, such as part-time work, flexible working schedules, phased retirement and early retirement. This approach assumes that the strategies to promote flexibility for employees and employers are not necessarily at odds with each other, and unlike the former approaches, an employee-centred arrangement does not necessarily provide disutility for employers, and *visa versa*. In addition, the arrangements that are categorized as providing utility for both sides need not provide less utility than the pure employee-centred or employer-centred arrangements, like it seems to be depicted in the approach in figure 1.

Table 1: Classification of flexibility arrangements

		Flexibility options for employees	
		Yes	No
Flexibility options for employers	Yes	<ul style="list-style-type: none"> <li>- Part-time work</li> <li>- Reduction of working hours</li> <li>- Flexible working time / schedule (working time accounts/ annualised hours)</li> <li>- Phased retirement</li> <li>- Early retirement</li> </ul>	<ul style="list-style-type: none"> <li>- Unusual working hours (night, evening shift, weekend shifts)</li> <li>- Shift work</li> <li>- Overtime</li> <li>- Temporary contracts</li> </ul>
	No	<ul style="list-style-type: none"> <li>- Parental leave</li> <li>- Long-term leave for care, education, training, and other reasons</li> </ul>	-

Source: Chung et al. (2007)

### 2.3. Country clusters

One of the interests of this study is how countries cluster, using the working time dimensions found in the study. In other words, if we can find meaningful country groupings using the components found for the working time flexibility practices of companies, and if they are comparable to the results found in previous studies. This country cluster analysis can also be seen as an additional robustness check of the concepts found in the study. When the country grouping results do not reflect our previous knowledge of working time regimes, this may entail a problem with the concepts found. In this section, we examine two working time regime theories, one based on the degree of flexibility and gender equity characteristics of the regimes, and another based on the negotiation structures and diversity of working hours.

In the study by Figart and Mutari (2000) they constitute working time regimes according to the degree of flexibility in work hours and relative gender equity in work schedules and economic roles. They derive four regime typologies. Firstly, there is the Male Breadwinner Work Time Regime, where both gender equity and flexibility is low. This regime is dominant in southern European countries, including Greece, Italy, Spain and Portugal. Secondly, there is the Liberal Flexibilization Work Time Regime, where gender equity is low but flexibility is high. UK and to a lesser extent Ireland are included in this regime. Thirdly, the Solidaristic Gender Equity Work Time Regime which has high gender equity but not as much flexibility. Here countries include Denmark, France, Belgium, and Finland. High Road Flexibilization, where both flexibility and gender equity is combined is theoretically defined but no country can be categorized as being within this group. Traditional Work Time regime although not theoretically defined, is found as a cluster of countries, where there are not as much gender equity but a general move towards flexibilization. In these

countries women usually participate in the labour market through the use of part-time work. This regime includes countries such as Germany, the Netherlands, Luxembourg, Austria, but also Sweden. In respects to our concepts, we can expect that countries with high flexibilization will have both high scores on both employer and employee-oriented working time components, and those which are more gender equal should be the countries with more employee-oriented working time arrangements.

Anxo and O'Reilly (2000) distinguish working time regime typologies based on the negotiation structures of the countries derive. They derive a statist, negotiated, and externally constrained working time regimes. In the statist working time regime, statutory regulations are the key element governing the use of flexibility and working time patterns, and collective bargaining has a limited role. These countries have a more normalized type of working hours. Example countries are Spain and France. Negotiated working time regime typologies emerge where there is a strong tradition of negotiation between social partners, and the state regulatory system only provides a basic framework. Examples of this system are Sweden, Finland, Denmark, Germany, Austria, and the Netherlands. Lastly, an externally constrained working time regime is one where there is free collective bargaining, and working time is distributed over a wider spectrum. Examples are Ireland and the UK (Anxo and O'Reilly, 2000). The theory Anxo and O'Reilly (2000) puts forward concerns the cross-national variance in the distribution of working hours, not necessarily the use of various working time flexibility arrangements. However, one can expect similar effects of negotiation structures on the use of working time arrangements. For instance, companies in externally constrained working time regimes will probably have more leeway to make use of flexible working time arrangements, especially those that facilitates employers' needs. On the other hand, in statist working time regime, statutory regulations may restrict the use of flexible arrangements, especially for the employer's need, but, provide legal obligations for companies in providing worker's work-life balance arrangements. For negotiated working time regimes, there are large possibilities for development of both types of working time flexibility, and in countries where unions are strong and mobilized, we can expect a development of employee-oriented arrangements.

The country groupings found in the two studies, differ in the fact that in the former study, there are two clusters that include the Northern and Continental countries, where as in the latter, there is only one. Both studies group Southern European countries, and Anglo-Saxon countries as separate clusters. The two studies also share the fact that the concepts used in the two regime typologies are based on theory, unlike ours which is also based on empirical practices of companies. However, both studies examine empirical data on country practices of countries to test if their concepts can distinguish countries into meaningful



groupings. This will also be done in this study, however, our country groupings will be derived statistically using cluster analysis. In addition, our analysis includes more countries than in the studies examined here, as well as including the new accession countries. This may impact the country groupings, however, we expect to find three or four clusters of countries, which reflect on the groupings found in the previous studies, and perhaps a distinct Eastern European cluster<sup>1</sup>.

## 2.4. Hypotheses

Following the review of literature in the previous sections, our hypotheses are:

H1: Working time flexibility can be grouped into bundles

H2: The grouping of arrangements is predominantly based on whose needs they facilitate, thus those for employers versus those for employees.

H3: The bundles of flexibility are of dichotomous dimensions rather than a linear continuum.

H4: We can find (three or four) distinctive country clusters when examining working time flexibility practices when using the components approach.

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<sup>1</sup> It is very hard to hypothesize how the new accession countries will be clustered in respects to other countries, because there has yet to be studies concerning these countries and their working time regimes.



## 3. Data and Method

### 3.1. The ESWT data

To investigate the three hypotheses derived from the previous section, establishment-level data is needed. The European Establishment Survey on Working Time and Work-life Balance (ESWT) offers a great opportunity, addressing a wide range of working time arrangements not available in other data sources. The ESWT provides establishment level information on the various arrangements that are created within a firm to enhance internal flexibility and to adapt to workers' preferences for combining work and non-work activities. The survey covered establishments with 10 or more employees across the EU-15 and six new accession countries (Cyprus, Czech Republic, Hungary, Latvia, Poland and Slovenia). Conducted between 2004 and 2005, in 21,031 establishments personnel managers and, if available, employee representatives were interviewed. By using the establishment weight we reproduce the structure of the universe in terms of size, class, sectors, and country (See Riedmann et al., 2006). For response rates and other technical issues concerning the survey, see Reidmann et al. (2006).

The key point of our analysis is to find a pan-European result that can be used to compare companies across Europe, thus we include all companies into our analysis. A limitation to this approach is that the arrangements may have different meaning in different countries, especially due to the different institutional context the arrangements are used in. However, the distinction of arrangements used in the survey is derived through previous studies on the company levels, and we can assume that they are relevant for all countries covered in the survey. In addition, if we consider the actual meaning of arrangements, it will differ not only depending on the country, but also sector, company and even the individual who is taking it up. Lastly, the difference found in the practices of companies due to institutional or other country level characteristics are one of the key aspects that are of interest in the larger project (see First author, 2009 for detailed analyses) but not examined here. In section four, we will comment upon the issue of country differences in the results found.

## 3.2. Method

To investigate the empirical underpinning of the grouping of employee- versus employer-centred working time flexibility, factor analysis is the most suitable method. Factor analysis reduces the numbers of variables by combining them into a single factor and it allows for the identification of interrelated variables, and thus for finding or classifying bundles (Statsoft, 2008). Factor analysis also assumes that internal attributes account for the observed variation and covariation across a range of observed surface attributes (Tucker and Mc Callum, 1997). The grouping of the arrangements is based on their covariation, thus how they are being used together, which in turn is indicating that they share a similar latent characteristic. The groupings can be understood as representing the working time arrangements bundles, but they can also be understood as representing the company's working time flexibility strategies, here measured as the latent factors. Following the literature and the stylized presentation in Figure 1 and Table 1, this study hypothesizes that the arrangements are expected to group into two latent factors, the employer-centred and the employee-centred arrangements.

The other analysis method used in this paper is cluster analysis. Cluster analysis seeks to identify homogeneous subgroups of cases in a population. It establishes group membership by identifying a set of groups with both minimum within-group variation, and maximum between-group variation (Garson, 2009). Of the various types of cluster analysis we use the hierarchical cluster method, where the researcher can select the definition of distance, as well as the linking method for forming clusters (Garson, 2009). Here we use the Squared Euclidian distance for the definition of distance which places greater emphasis on objects further apart, thus increasing the effect of outliers (Garson, 2009). In addition, for the linking method, we use Ward's method which uses the sum of distances from each case in a cluster to find the grouping with the least sum of squares.

## 3.3. The arrangements included in the analysis

The results of the factor analysis and the groupings of the arrangements depend heavily on the indicators (variables) chosen, as the outcomes rely on the number of indicators included representing a certain idea or type. The exclusion of relevant variables and the inclusion of irrelevant variables in factor analysis will affect the factors which are uncovered, often substantially (Kim and Mueller, 1978; Garson, 2008). Hence, the initial choice of the indicators used for the analysis is crucial. Following the assumption on the

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employer- versus employee-centred divide, hereafter the variables included in the analysis are presented briefly.

If we were to include all variables in the ESWT data set in our analysis, it would result in a grouping of arrangements based on the data. This would be arbitrary and without any theoretical basis, and the results would be misleading. For this reason, we needed to be careful in selecting the variables to be included in the analysis. We excluded the variables unrelated to flexible working time arrangements, such as external numerical flexibility arrangements and work-life balance facilities. Of the working time related arrangements, parental leave is excluded due to the problematic manner in which the question was asked in the survey<sup>2</sup>.

The ten working time arrangements relevant to the analysis are depicted in Table 2. If the survey question asked whether the company used the arrangement, we consider this a use question, if the question asked whether the company made the arrangement available to their workers, we consider this an available question. The difference between these two types of questions is due to the characteristics of the arrangements. The take-up of the employer-centred arrangements is in most cases decided by managers or the company, based on their need for such time variations. Thus at company level it is relevant to measure whether or not the company has used the arrangements. The take-up of the employee-centred arrangements is in most cases decided by the workers themselves. Companies can make certain arrangements available for workers to use, but only the workers choose to use them. Thus, in these cases the survey questions ask whether the companies make the arrangements available or not. The third and fourth columns represent whether or not the arrangements are hypothesized to facilitate the needs of employer and/or employees based on previous studies, as discussed in section two.

Note that the use and the availability of all arrangements are measured dichotomous. We have no data indicating to what extent the arrangements are being used, let alone which specific groups of workers are affected. Thus, in some companies the use or the availability of an arrangement may apply to only a small, specific group of workers, and not to others. There can even be a segmentation of the workers concerning the use or the availability of various working time arrangements. The issue of who gets what is important when examining company policies regarding working time flexibility. However, it is not covered in this paper due to limitations in the data.

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2 For a more details see Chung (2009).

Table 2. Variables included in the analysis

Variables	Note	Employer centred	Employee centred	Averages
The use of unusual hours		√		42.5%
The use of shift work	Regularly changing working hours due to the nature of the job	√		23.4%
The use of overtime	Paid or unpaid	√		74.7%
The availability of long-term leave for care or illness in family	Paid or unpaid		√	41.3%
The availability of long-term leave for training or education	Paid or unpaid		√	40.7%
The availability of long-term leave for other purposes	Paid or unpaid		√	28.9%
The use of part-time work		√	√	65.3%
The right to work part-time	The possibility of full-time employees to go to a part-time contract <sup>b</sup>	√	√	41.6%
The availability of phased retirement	Only asked to companies with 50+ workers / possibility to reduce their weekly working hours before retirement <sup>c</sup>	√	√	35.1%
The use of flexible working hours	Worker has possibility to adapt starting or ending time of work	√	√	48.5%

a: "Use" questions were asked on whether the company had used or was using the arrangement for more than 1 worker, "available" questions were asked on whether the company had or made such arrangements available to its workers.

b: When full-time workers "can get appropriate job quickly" or "has to wait for some time" to get a part-time contract, it is considered as there being a possibility to reduce working hours. When it was "possible only exceptionally" or there were "no chance" to change to part-time it is considered as there not being a possibility. This question was asked for skilled workers and unskilled workers separately, and here the average score for both was used.

c: Companies without workers who are 50 or older were considered not to have this arrangement

Now we will elaborate on the reasons behind the choice of the specific variables included in the analysis.

As this study hypothesizes that the arrangements are expected to group into two latent factors, the employer-centred and the employee-centred arrangements, we examine them accordingly.

Regarding the employer-centred arrangements, the use of unusual hours, that is working evenings, nights and weekends, is included in the analysis, Shift work, thus working in varying shifts that can be within the normal or unusual working hours, is also included. The use of overtime is another included working time flexibility arrangement, which gears towards employers. Here, overtime refers to both paid and unpaid overtime.

As for the employee-centred arrangements, three long-term leaves, notably leaves for care or illness in the family, leaves for training or education, and leave for other purposes, are included as three distinct arrangements. This is because long leaves are important especially in countries where full-time jobs are the norm and long leaves therefore facilitate the work-life balance. This is in contrast to those countries where part-time jobs and other reduced working hour arrangements facilitate the work-life balance. As an equal number of employer- and employee-centred arrangements is desirable for the analyses, these three leave arrangements allow for this equal weighting. Moreover, the three types of long-term leave arrangements seem to have distinct characteristics of their own, all of which are of great importance in the current labour market debate.

Finally, some arrangements can facilitate both employers' and employees' needs. These include the use of part-time work, the right to reduce working hours, the use of flexible working hours, the use of working time accounts, and the use of phased retirement. In the survey, the right to reduce working hours refers to the possibility for full-time workers to change to part-time hours in a relatively easy manner. Companies using part-time work may also have such arrangements. However, we include both the use of part-time work and the right to reduce working hours separately, mostly because in companies where part-time and full-time jobs are highly segmented, the use of part-time jobs may not go along with the right to reduce working hours. In addition, the right to reduce working hours is an increasingly important work-life balance option<sup>3</sup> which should be examined separately.

Phased retirement might be considered similar to part-time work and the right to reduce working hours. By definition, since phased retirement is the reduction of working hours before going into full retirement, this would be the same as the reduction of full-time working hours. However, since reduction of working hours is primarily taken up by women for child-rearing (Tijdens, 2002), and phased retirement is aiming at older workers, these two arrangements are considered to be different sets of policies. In the ESWT data, approximately half of the establishments that provide the right to part-time work do not offer phased retirement, and approximately one third of the establishments that provide phased retirement do not offer the right to part-time work. Thus it seems feasible to include phased-retirement as a distinct arrangement in our analysis<sup>4</sup>.

3 In 2000, the Netherlands introduced in their working time legislation a right to decrease working hours (Wet Aanpassing Arbeidsduur: WAA), and in 2005, in the UK this right was also introduced for parents with children under the age of 6 in the Work and Families Bill and is planned to be extended to those with children under the age of 16 by April 2009 (EIRO, 2005; Telegraph 26th August, 2008).

4 However, there are some limitations to the phased retirement data. The question was asked only to establishments with workers over 50 years of age, thus in the analysis, the companies without older workers have been treated as offering no phased retirement. For more detail see Chung (2009).

The last arrangement included in the analysis is flexible working hours. Flexible working hours is defined as the possibility for workers to adapt the starting and ending time of work according to their preferences. In the survey, the possibility to accumulate hours, thus working time accounts has also been asked, but only to companies using flexible working hours. Therefore, including working time accounts on top of flexible working hours would be putting extra emphasis on flexible working hours and was considered as double counting. For this reason, although important, we do not include working time accounts in our analysis.



## 4. Analysis outcomes

### 4.1. Factor analysis outcomes

In this section, we examine the outcomes of the factor analysis. Firstly, we tested to see whether the factors derived were correlated, through the use of the promax solution and found no strong correlations. For this reason we chose a varimax solution, the most commonly used orthogonal method, presuming a non-correlation between the two factors derived. Selecting the number of factors based on the Kaiser-criterion<sup>5</sup>, the first outcome shows three factors derived from the ten arrangements.

The first factor shows high factor loadings for all of the long-leave arrangements (Table 3). This could also be interpreted as the working time flexibility for employees factor, since leave schemes accommodate the needs of the worker more than other arrangements. The second factor can be named working time flexibility for employers factor, with overtime, unusual hours, and shift work all showing high factor loadings. The third factor includes the four arrangements that have been noted in the hypothesis as being working time flexibility for both employers and employees, that is, phased retirement, part-time work, flexible working time arrangements, and the right to reduce working hours. The naming of the factors not only comes from how the arrangements grouped into three separate factors depending on their highest loading scores, but from their loadings on other factors as well. We can see that the arrangements have almost no loading or very slight negative loading on the factors other than their main factor. The exception to this is part-time work, where there is a slight positive loading on factor 1 and overtime with a slight positive loading on factor 2.

The last column of Table 3 shows the communality scores for each variable. Communalities represent the extent to which the factors explain each variable. The higher the communality score, the better the variable is explained by the factors derived (R-square). As the table shows, the use of overtime and flexible working schemes is not explained much by the two factors derived in this analysis.

<sup>5</sup> This method chooses the number of factors that has the eigen value over 1. If a factor has the eigen value of less than 1, this means that the factor does not explain as much as the equivalent of one original variable added.

Table 3. Factor analysis, varimax rotation three factor outcome

Variable	Factor1	Factor2	Factor3	Communalities
Care leave	<b>0.82</b>	0.11	0.01	0.68
Education leave	<b>0.83</b>	0.07	0.05	0.69
Other leave	<b>0.70</b>	0.05	0.01	0.49
Overtime	- 0.01	0.22	<b>0.36</b>	0.18
Unusual hours	- 0.01	0.05	<b>0.80</b>	0.65
Shift work	0.07	0.02	<b>0.79</b>	0.63
Phased retirement	0.07	<b>0.41</b>	- 0.02	0.17
Flexible working hours	0.01	<b>0.72</b>	0.07	0.53
Part-time work	0.23	<b>0.60</b>	0.02	0.41
Reduce working hours	0.14	<b>0.72</b>	0.05	0.54

*Explained variance: 49.8%*

*Establishment weighted. Highest loadings in bold.*

To test our hypothesis of two dimensions of working time flexibility bundles we restrict the number of factors to two, as Table 4 shows. A two-factor analysis allows for both a clearer conceptual distinction and more simplicity in our analysis. In addition, reflects what is hypothesized by previous studies as well as this paper. However, this approach does not allow for differentiating the flexibility options which can potentially be used for the benefit of both parties from the other factors. The two-factor analysis groups the arrangements that benefit the employees as a first factor, and those that benefit employers as a second factor, as hypothesized in the paper. The grouping found cannot be seen as confirming the competing hypothesis of the division of full-time oriented versus part-time oriented working time options, as shown in the vertical axis in Figure 1. The arrangements that were once in the second factor, working time flexibility for both employees and employers, load on both factors relatively similarly. The exception to this is the use of part-time work, where the loading score on the second factor is higher. This can be due to the fact that, although varying across countries and individuals within countries, part-time work is more often than not used to facilitate establishments' needs to adapt to workloads. The right to reduce working hours' higher loading on factor two may have to do with its high correlation to part-time work. Compared to the results in Table 3, the communalities observed in table 4 are lower for all variables with the exception of phased-retirement. This decrease is especially notable for flexible working hours, which may be related to the loss of the third dimension, *flexibility for both*.

Table 4. Factor analysis, varimax rotation two factors outcome

Variable	Factor1	Factor2	Communalities
Care leave	<b>0.79</b>	0.00	0.63
Education leave	<b>0.78</b>	0.01	0.61
Other leave	<b>0.66</b>	- 0.02	0.44
Overtime	0.01	<b>0.42</b>	0.18
Unusual hours	- 0.13	<b>0.66</b>	0.45
Shift work	- 0.06	<b>0.63</b>	0.39
Phased retirement	<b>0.42</b>	<b>0.36</b>	0.31
Flexible working hours	<b>0.20</b>	<b>0.24</b>	0.10
Part-time work	<b>0.25</b>	<b>0.50</b>	0.31
Reduce working hours	<b>0.37</b>	<b>0.47</b>	0.36

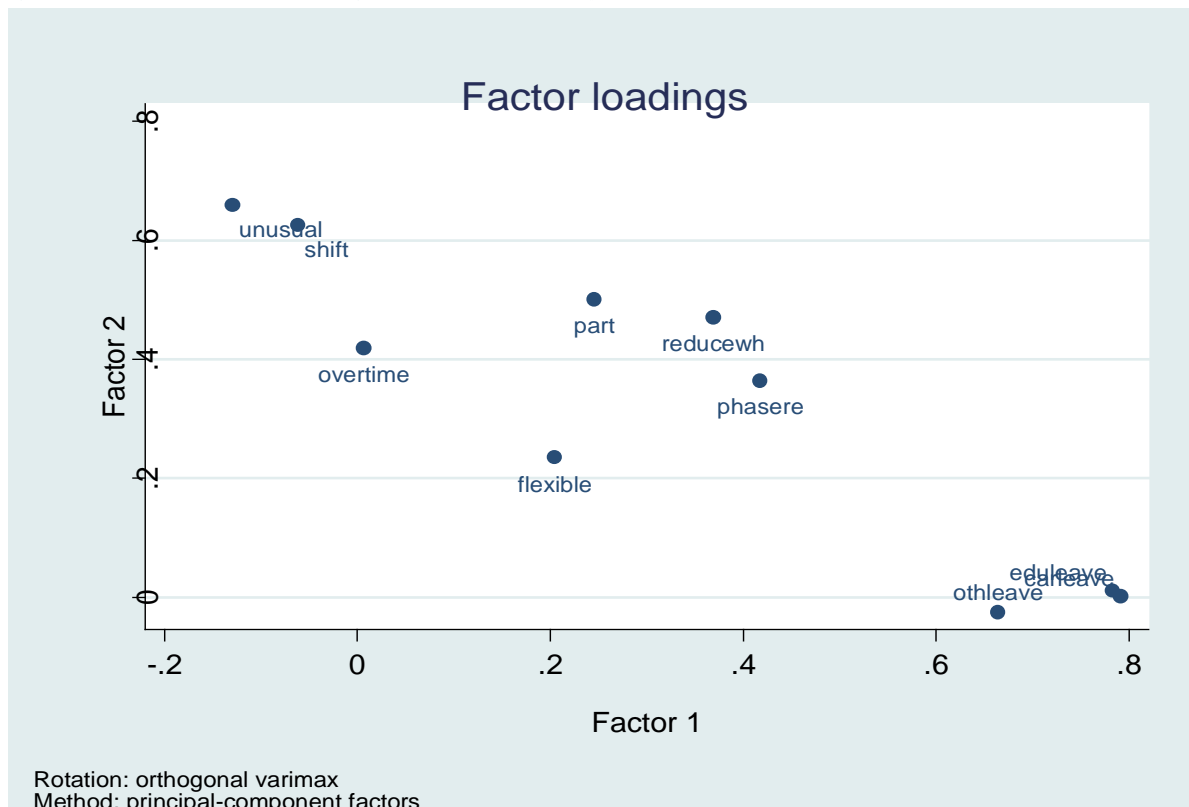
*Explained variance: 37.7%*

*Establishment weighted. Highest loadings in bold.*

Based on the results shown in Table 3 and Table 4, we can conclude that we have confirmed our first and second hypotheses. Thus, working time arrangements can be grouped into bundles, and the most prominent latent characteristics that groups the bundles are to whose needs the arrangements facilitate. One important thing to note here is that there are three or two separate factors and not one dominant factor. If it were that the latent factor was actually a linear continuum, and factor 1 and factor 2 were two sides of the same coin, we would see high loadings for both factors but of different directions, which could be represented as one factor. This entails that, if the factors can in fact be distinguished as flexibility for employees and flexibility for employers, they are not on one linear continuum as depicted in Figure 1, but are more likely two dimensions as in Table 1. To test this further we also run a factor analysis restricted to one factor. The results show that it seems unlikely that the employer-employee needs can be measured by one factor, thus one latent variable<sup>6</sup>. In addition, the fact that the two factors are not highly negatively correlated to each other is additional evidence that they cannot necessarily be seen as being within a linear line which is at odds with each other, but rather a two- dimensional relationship. The two dimensions can be depicted as shown in Figure 2.

<sup>6</sup> For detailed analysis and discussion see Chung (2009).

Figure 2. Dimensions of working time flexibility components



## 4.2. Robustness of factors

The results in the previous section have been derived from the inclusion of all establishment cases in the ESWT. This pan-European pan-sector analysis, taking all establishments of all sectors and countries together, may raise problems because it gives natural weights to large countries, such as Germany, France, and the UK, as well as to large sectors, such as manufacturing. Therefore, we have tested the robustness of the factors by examining the two factor varimax analysis outcomes separately for each country and for each of the 13 industries<sup>7</sup>.

The outcomes show that the four arrangements that facilitate flexibility needs for both, namely phased retirement, flexible working hours, part-time work, and right to reduce working hours, do show some deviations from the analysis that included all countries and all industries. Their loadings are not necessarily equal for both factors, and sometimes have a higher loading on one, with some even showing no or slightly negative loadings on the other. A plausible interpretation is that the arrangements facilitating both sides' flexibility needs are in specific countries or in specific sectors more geared towards either employees or employers. Country deviances, for example, can be noticed in Denmark, Finland and Sweden. Here, the arrangements

<sup>7</sup> Results can be provided upon request.

facilitating the flexibility needs for both parties have higher loadings on the working time flexibility for employees factor than the European average, and lower or even negative loadings on the employers factor. The opposite effect is seen in countries such as the UK.

Figure 3. Factor analysis results for Denmark and UK



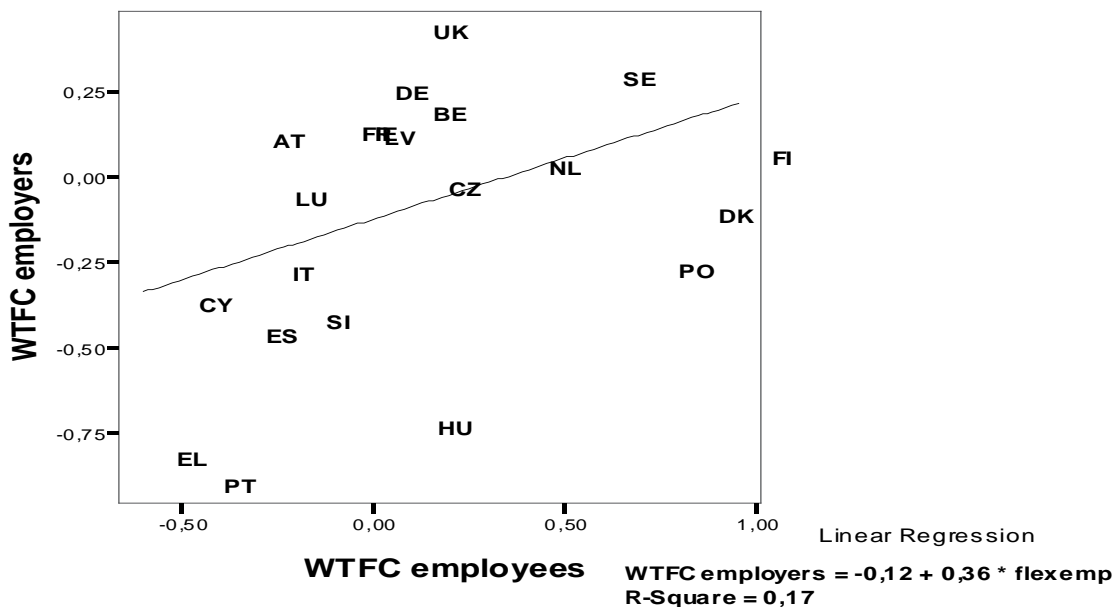
In addition, when examining the results for each country and sector separately, overtime and very infrequently other long-term leave also show deviations from the results of the pan-European pan-sector factor analysis outcomes. Overtime having high loadings on the employee-oriented arrangements may be due to the fact that it is sometimes taken up by workers voluntarily for additional income. It may also be due to workers taking up long-term leave. Without additional workforce to do the person's job, co-workers must work overtime to supplement the increased workload per person.

Regardless of such deviations, from our examinations of European establishments it can be concluded that working time flexibility arrangements can be grouped in bundles. In addition, the most prominent characteristics that can group the arrangements are the extent to which they facilitate employees' needs for flexibility and the extent to which they facilitate employers' needs for flexibility.

### 4.3. Clusters of countries

Figure 3 is a graphical depiction of the aggregate component scores for each country for each factor. We can see that there seems to be a positive relationship between employee-oriented WTFC and employer-oriented WTFC, at least at the aggregate macro-level. In other words, countries with a high average score of employee-oriented WTFC are also likely to have a high average score of employer-oriented WTFC. This implies that at least at the national level, the two types of working time flexibility seems to be compatible. This result also seem to be in line with our third hypothesis, that the employee- and employer-oriented working time components are not necessarily at odds with one another.

Figure 4. Average working time flexibility component score per country and their respective groupings



When we examine the country average scores closely, we can see a pattern between countries. Three clusters are found using the hierarchical cluster analysis. The first distinct country grouping found is the southern European country grouping, including Greece, Portugal, Spain, Italy, Cyprus, and two new accession countries which are also located in the south eastern part of Europe, Slovenia and Hungary. These countries show low average scores for both the employee-oriented component and the employer-oriented component. The second country grouping includes all the northern European countries, that is, Denmark, Finland, Sweden, the Netherlands, and also Poland and the Czech Republic. These countries can be charac-

terised as having high average score of both of the employee- and employer-oriented component. Thirdly, we find the last grouping, which consists of Austria, Belgium, France, Germany, Ireland, Latvia, Luxembourg, and the UK. These countries can be characterised as having as high average score for the employer-oriented component as the northern European country grouping. However, they do not show as high scores for the employee-oriented component, although they are higher than that found for the southern European country grouping. Table 5 summarizes the results found for country clustering.

The country grouping somewhat reflects the working time regime typologies found in the previous studies, but differs in three aspects. Firstly, our study includes the new accession countries. These countries are included in the various clusters, without forming a new cluster of their own. Secondly, we cannot find a distinct Anglo-Saxon cluster, as mentioned in the previous studies. Thirdly, our typology seems to have a more distinct Northern European cluster. However, otherwise, the position of the countries reflect the findings found in previous typologies, concerning the amount of flexibility as well as the gender equity, here represented as employee-friendliness of the working time arrangements.





## 5. Conclusions

This paper is a first attempt to empirically investigate the possibility of using working time component approach in the analysis of working time flexibility. This is done through the use of the Establishment Survey on Working Time (ESWT) 2004/2005, which covers establishments in 21 EU member states. Based on the previous studies, we arrived at four hypotheses. Our first hypothesis was that working time arrangements are not single entities but can be grouped into bundles of working time arrangements. Secondly, the extent to which the arrangements facilitate the needs of employees and/or employers would be the main characteristic that groups the arrangements. Our third hypothesis was that the employee- and employer-centred bundles are not placed in a linear relationship where they are at odds with one another, but that they constitute two different dimensions of flexibility. Our fourth hypothesis was that using the components derived from the factor analysis we can arrive at meaningful country scores, and country clusters, which reflects the results found in previous studies. All four hypotheses were confirmed. The results from the factor analysis confirmed that two or three main factors group the working time arrangements. The grouping of the factors can indeed be seen as representing whose needs the arrangement facilitates, notably, the employer or the employee. In addition, we could not find a single dominant factor which may represent a linear relationship between the two characteristics, but two or three dimensions in which the employer's and employee's factors are separate dimensions. We have also tested the stability of the factor analysis outcome, by examining the separate outcomes per country and per industry. The result shows that although there are some deviations from the pan-Europe and pan-industry outcome, the naming of the factors as flexibility for employees and flexibility for employers can be interpreted as holding rather stable across countries and across industries.

Lastly, using the components derived, we map out the 21 countries in our analysis to see if any meaningful groupings of countries could be found. Through cluster analysis, we can see that there are three groups of countries. Firstly, there is the southern European country cluster with Hungary and Slovenia, where the average company does not use much working time arrangements, neither for the employees nor for the employers. Secondly, we find the northern European country cluster with Czech Republic and Poland, where both employee- and employer-oriented working time arrangements are used extensively. Lastly, we find a cluster for the remaining countries, the continental European countries and the Anglo-Saxon countries. Here the employer-oriented working time component score is high, and are comparable to that of the Nordic countries, yet their employee-oriented working time component score is in between the northern

and southern European country clusters. This grouping reflects somewhat the results found in previous studies.

Through this paper we have found bundles or latent strategies of working time flexibility. Based on this result we can argue that it is possible to examine working time arrangements in combination through the use of latent component scores, i.e., the employee-oriented working time flexibility component score versus the employer-oriented working time flexibility component score. When examining the country scores and clusters, the outcomes reveal rather meaningful results concerning working time practices, which do not conflict with the findings found in other studies. The use of the components approach method allows for simplifying the way researchers examine working time arrangements, and allows for taking a more holistic view of companies' working time strategies in comparison to examining arrangements separately as single entities, which was the predominant method until now.

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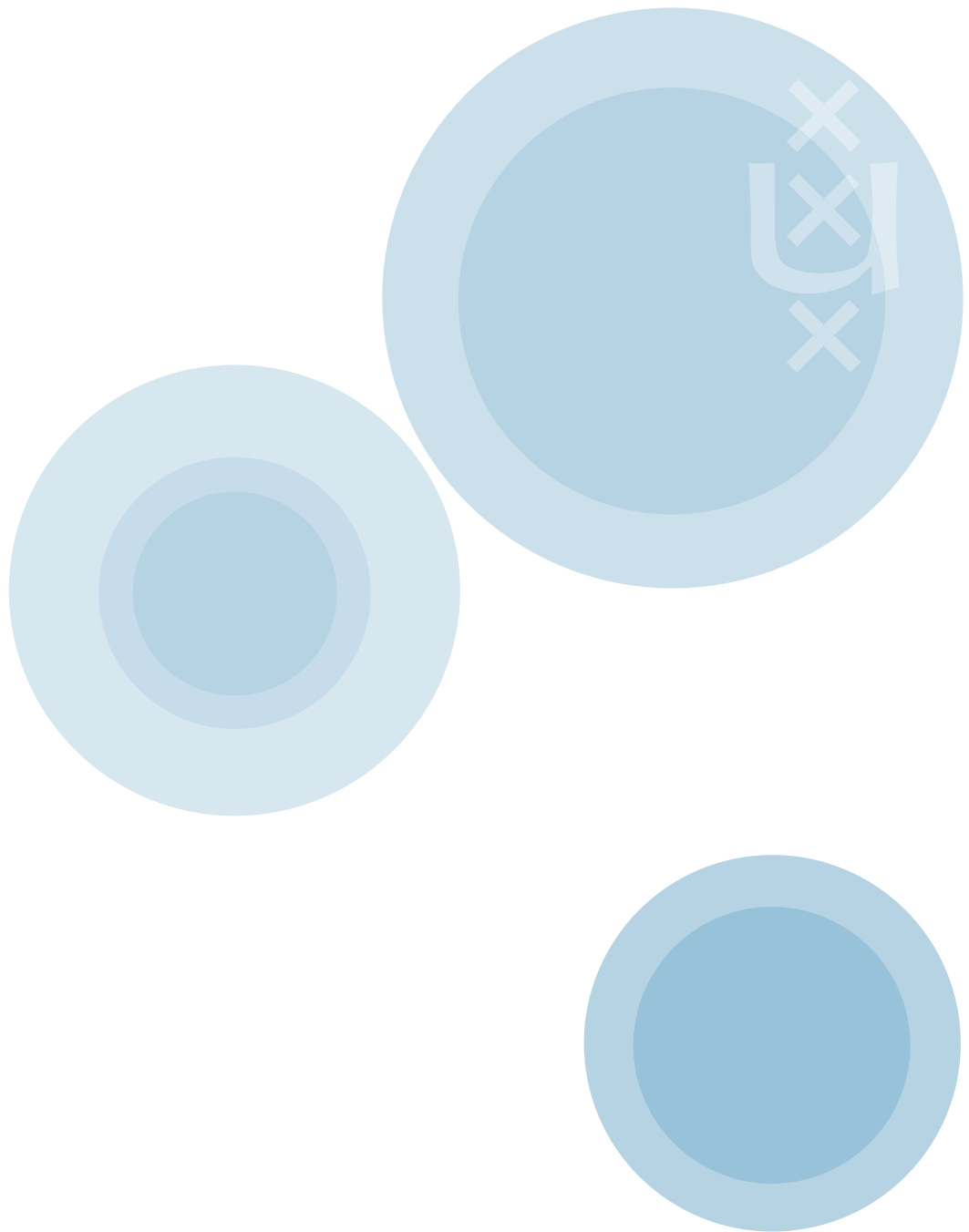
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AIAS is a young interdisciplinary institute, established in 1998, aiming to become the leading expert centre in the Netherlands for research on industrial relations, organisation of work, wage formation and labour market inequalities. As a network organisation, AIAS brings together high-level expertise at the University of Amsterdam from five disciplines:

- Law
- Economics
- Sociology
- Psychology
- Health and safety studies

AIAS provides both teaching and research. On the teaching side it offers a Masters in Comparative Labour and Organisation Studies and one in Human Resource Management. In addition, it organizes special courses in co-operation with other organisations such as the Netherlands Centre for Social Innovation (NCSI), the Netherlands Institute for Small and Medium-sized Companies (MKB-Nederland), the National Centre for Industrial Relations ‘De Burcht’, the National Institute for Co-determination (GBIO), and the Netherlands Institute of International Relations ‘Clingendael’. AIAS has an extensive research program (2004-2008) on Institutions, Inequalities and Internationalisation, building on the research performed by its member scholars. Current research themes effectively include:

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- The distribution of responsibility between the state and the market in social security
- The wage-indicator and world-wide comparison of employment conditions
- The projects of the LoWER network



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