

THE DETERMINANTS OF THE NUMBER OF HR  
STAFF IN ORGANISATIONS: THEORY AND  
EMPIRICAL EVIDENCE

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## **ABSTRACT**

*The current paper develops a range of hypotheses about the determinants of the human resources staff ratios in organisations and tests them using empirical survey data from European organisations. We find that country of residence, sector and organisational size, are the key determinants of HR staff ratios. We also identify other determinants of HR staff ratios. For example, in capital-intensive organisations, and in organisations that make use of job rotation, higher HR staff ratios are observed. Devolution of HR responsibilities to line management effectively reduces the number of HR staff. Interestingly, higher staff turnover rates are not associated with higher HR staff ratios.*

## 1. INTRODUCTION

Human resource management specialists feel under pressure to justify themselves and to prove that their departments are not overstaffed. There are two sets of reasons for this. The first is that senior managers outside the function inevitably see the department as an "overhead" cost and wonder whether the organisation has enough people in it to support the human resource management policies or, more frequently, whether it has too many. The second reason for human resource specialists to ensure that they have only enough staff in the function is that other employees outside the function may see human resource specialists as the group that has been responsible for ensuring that organisations are "lean" and downsized. It creates difficulties when the department that is seen to have such responsibilities cannot provide evidence that it too is tightly and cost-effectively managed. It is not sufficient for human resource management specialists to organise the wage administration or to show how a strategic approach to human resource management may contribute to the organisation's business objectives. They also have to show that the HR department is properly staffed.

Information on the link between organisational characteristics and the size of the organisation's HR staff is therefore useful for HR practitioners, and top management, who wish to be informed whether the size of their organisations' HR staff is different from similar organisations. Although we are aware of the existence of rules of thumb (in the United States, the HR staff ratio is recommended to be around 0.01, thus one HR staff member per hundred employees, see Walker, 1988), we argue that these are too crude, and, accordingly, misleading. We will demonstrate that a sound description of the

HR staff ratios of a great variety of organisations needs to distinguish at least between country of residence, industrial sector and size of organisation; and preferably also between labour and capital intensive organisations, extent of training, the degree of HR responsibilities assigned to line management, and the use of job rotation in order to be useful as a benchmark. Information on less tangible issues such as HR strategies may also be useful.

Information on the link between organisational characteristics and the size of the organisation's HR staff is not only useful for practitioners, but may also be used to test theories of management, and of human resource management in particular. Human resource management theories typically describe how organisations make use of their human resources at an operational, medium-term and long-term level (Sundaram and Black, 1992). The way in which organisations make use of their human resources affects the organisation of the HR departments and therefore the number of HR staff needed. In other words, an organisation is assumed to choose the size of its HR department in such a way that it adapts to the specific situation - the external and internal environments - faced by the organisation. The internal environment includes such factors as organisational size and the characteristics of the workforce. The external environment includes factors such as the nature of competition, legal, political, and cultural factors (Schuler and Huber, 1993). The theoretically presumed adaptation of organisations to specific situations often leads to testable hypotheses on the size of the HR department. For example, scholars argue that human resource management in multinationals is structurally different from other organisations, since multinationals operate in various institutional environments

(Rosenzweig and Singh, 1991). It is argued that HR staff in these situations have to deal with not only the requirements of different local environments, but also the pressure to have consistent HRM policies within the multinational (Ferner, 1997). If this reasoning is correct, multinationals require more HR staff to deal with this additional pressure.

Despite the need for information on HR staff by practitioners, there is surprisingly little empirical research demonstrating the causal links between various determinants and numbers of HR staff. Studies that focus on the number of HR staff merely distinguish between a few determinants of HR staff, in particular the size of the organisation and industrial sector (see, for example, APAC, 1997, Bureau of National Affairs, 1992, Marginson et al. 1993). However, because an insufficient number of determinants are controlled for, the interpretation of the results of these studies is often troublesome. For example, in a study of 176 large companies in the UK, a negative relationship between degrees of diversification of the organisation, and corporate human resource managers was identified (Marginson et al., 1993). Thus, "the greater the diversification and the more parts of the firm are, the more likely it is that there will be a small corporate personnel department and that business units will be given greater freedom to determine their own policies" (Purcell, 1995, p. 72). Although this interpretation may be correct, it fails to recognise that more diversified companies tend to be larger than single businesses (Purcell, 1995, p. 65) *and* that larger organisations tend to have less HR staff (Schuler and Huber, 1993). Consequently, the empirical relationship may be spurious and further tests of this empirical relationship need to rely on the use of a sufficient number of control variables. We are aware of only one other study that analyses various

determinants of HR staff (Walker, 1988), although this study relies on perceptions of management and is therefore neither able to test interesting hypotheses thoroughly, nor to quantify the effect of the determinants on HR staff. In short, we are not aware of any study that has systematically discussed and tested hypotheses on the relationship between the organisational characteristics and the number of HR staff. The present study is therefore the first attempt to identify the determinants of the number of HR staff by formulating hypotheses on HR staff and by examining data of a large sample of organisations drawn from a wide range of sectors and countries.

The structure of the paper is as follows. In section 2 a theoretical framework for the size of the HR staff is outlined. Section 3 introduces the data and the statistical model. In section 4 empirical tests of these hypotheses are discussed and conclusions are drawn in section 5.

## **2. BACKGROUND AND HYPOTHESES**

Previous descriptive studies of the size of HR staff have focused on the HR staff ratio, defined as the number of HR staff divided by total headcount. Since studies report either the mean or the median of HR staff ratio, comparison of the studies is not straightforward (the mean is larger than the median, since the distribution of the HR staff ratio is skewed to the right). The following studies are illustrative. In the UK, estimates of the *mean* HR staff ratio vary between 0.010 and 0.013 (Harrison 1992, quoted in Mayo 1995, APAC, 1997). In West Germany, the mean is estimated to be around 0.011 (Brewster and Mayne, 1995). In the United States, the *median* ratio is around 0.011 (Schuler and Hubert, 1993,

p. 26).

Reviewing what literature there is on the HR staff ratio, two important messages emerge. First, despite differences in the exact definition of 'HR staff' (and the difficulty of obtaining representative samples), the variation in mean/median HR ratio's *among studies in different countries* is rather low (e. g. as illustrated above, the difference in the mean ratio between the UK and West Germany is only 0.01). So, the meaning of the term 'HR staff' does not vary as much over time and countries as one may imagine. This also indicates that measurement errors and idiosyncratic differences in interpretation of the term HR staff cancel out in the mean. Second, the variation in HR ratios *among organisations* is extremely large. For example, in a study of 256 organisations in the US, ratios of exempt HR employees to total employees ranges from 1:18 to 1: 2000 (Walker, 1988). Although such an extreme variation may be partly due to measurement errors and to differences in interpretation of the term "HR staff", it seems plausible that the HR staff ratio differs strongly among organisations. This raises the question of which organisational characteristics may explain this large variation in HR staff ratios.

Some studies distinguish between different levels of HR staff in terms of qualification (Tyson and Wikander 1994), between specialist and support staff (Walker 1988, Millward et al.1992; Sisson 1995), or focus on management staff working full-time in personnel in headquarters (Marginson et al.1993). Depending on the focus of the research, this may have some advantages. However, one of the disadvantages is that comparisons of specific HR staff categories among various countries are more

problematic, owing to difficulties in translating the concepts into other languages and across cultures. For example, studies in the United States have focused on the *exempt* HR staff ratio (which is about 0.007, Walker 1988). However, outside the United States, the term 'exempt ' is not understood, and it is difficult to come up with a translation that matches the full concept.

The overall aim of the current paper is to identify the characteristics that influence the HR staff ratio. These characteristics are presented here in a series of hypotheses. Most of these hypotheses are new, whereas a few have been derived from a study of seven major US corporations revealing some of the influential characteristics (Walker, 1988). First, however, we define HR staff more precisely and discuss briefly the theoretical background.

## **2.1 Definition of HR Staff**

A comparison of HR staff between organisations requires a definition of HR staff. In this study, we opt for a broad definition of HR staff that matches our interests and our empirical investigation. It includes not only staff members who deal with recruiting, retaining, firing, motivating and developing the organisation's employees, but it also includes staff members that deal with personnel functions such as wage administration and training. In line with our overall objectives here we make no attempt to distinguish between different levels of staff in terms of qualification or between the (often spuriously defined) specialist and support staff (Walker 1988, Millward et al.1992; Sisson 1995). Our concern here is for overall numbers.

## 2.2 Theoretical Background

A study of HR staff needs to explain, firstly, why organisations make use of specialised HR staff and, secondly, why similar organisations tend to use the same number of HR staff.

To explain why organisations make use of specialised HR staff, and which organisational characteristics affect the number of HR staff, we use ideas developed in various theoretical areas. These include neo-classical economics (see eg Thompson and Dormby, 1993), agency theory (see eg Eisenhardt, 1989), international human resource management (see eg Ferner, 1997, Sundaram and Black, 1992), cultural studies (see eg Hofstede, 1980), models of competitive advantage and strategy (see eg Porter, 1980). The theoretical framework is based on the idea that the number of HR staff is determined by the organisations' *costs* and *benefits* associated with HR staff, *given* the total number of employees in the organisation. Thus, we deal with the HR staff *ratio*.

We argue that the observed variation in HR staff ratio among organisations caused by organisational differences in HR staff costs must be small. The costs associated with HR staff consist mainly of labour costs (wages and overhead). Presumably, labour costs of HR staff relative to other staff costs hardly depend on organisational characteristics. Thus, the HR staff ratio is unlikely to reflect differences in labour costs. Therefore, in the current paper, the theoretical framework excludes the organisations' costs associated with HR staff and concentrates on the organisations' benefits associated with HR staff. Clearly, these benefits are related to the roles of the HR staff within the organisation.

The potential roles of the human resource staff/department have been extensively discussed in the literature and in textbooks of human resource management (see, for example, Schuler and Huber, 1993; Storey 1992, 1995; Ulrich 1995). Traditionally, human resource staff had a relatively limited involvement in the organisation's affairs and goals and dealt mainly at the operational level (e.g., wage administration). In such circumstances, the presence of human resource staff is justified mainly as enabling the organisation to enjoy economies of scale and specialisation, arguments generally associated with neo-classical economics. Although most large organisations have a human resource department that performs these supportive HR activities, operational activities do not have to be performed necessarily within the hierarchy of the organisation and can be outsourced to the market. With the growing importance of human resource management to the success of the organisation however, human resource departments have become involved at the medium-term (for example, the development of recruitment marketing plans) and strategic level (for example, a relocation of the organisation). From this perspective, HR staff support line managers. HR activities at the medium-term and strategic level will predominantly be performed within the organisation.

Many HR activities can be implemented by either human resource management specialists or by line managers. Although the human resource departments may delegate much of the implementation of human resource activities to line managers, human resource staff are often responsible for seeing that activities are implemented consistently (Brewster et al. 1997). Thus, human resource staff monitor and co-ordinate line

managers' activities in the area of people management by, for instance, checking whether recruitment procedures are in line with the organisations' policies. Monitoring is necessary, since the motives of line managers may not be aligned with the objectives of the organisation. From this perspective, HR staff are useful for curbing the self-serving behaviour of line managers by means of information gathering and standardisation of internal procedures. Such a reasoning is consistent with agency theory (Eisenhardt, 1989, Fama 1980): from this perspective, senior management will attempt to reduce information asymmetry by making use of HR staff, who inform senior management about what the line manager is doing and are likely to curb the line manager's opportunism. For example, line managers have little incentive to give training to their employees, when (the best) employees will move to other departments (the benefits of training are external to the line managers). So, it is in the advantage of the organisation that the human resource department makes sure that employees receive enough training.

As to the second issue, various theories support the notion that similar organisations tend to make use of the same number of HR staff. For example, institutional theorists argue that organisations feel the pressure to conform with the expectations of the stakeholders to introduce business measures of interest to stakeholders. Since the expectations of these stakeholders tend to be the same for all organisations, similar measures spread throughout the population of organisations. In contrast, economists argue that organisations aim to maximise profit or minimise costs. Due to competition, organisations that under-perform will be threatened to go bankrupt and disappear from the population of organisations. Thus, due to competition between organisations, beneficial measures spread throughout

the population. Although institutional theorists and economists may disagree as to why similar business practises spread out, they agree that (competing) organisations tend to similar practices. Thus, one expects that organisational characteristics may explain variation in HR ratios to a certain extent. Nevertheless, since the HR staff ratio is small and, thus, the effect on the overall profit is small, organisations may employ for a substantial period less, or more, HR staff than would be optimal from a maximising-profit principle. In addition, the expectations of stakeholders with respect to the HR staff ratio may not be well formulated, for example, due to the absence of benchmark information. As a consequence, one expects a substantial variation in HR staff ratios between organisations that may not be explained by organisational characteristics, due to individual-specific differences between organisations.

### **2.3 The Characteristics and Hypotheses**

**The Overall Headcount.** One of the key differentiating characteristics of an organisation is the overall headcount. It may be argued that the overall headcount is the single most important determinant of the number of HR staff, since HR staff deal explicitly with other employees in the organisation. If the number of HR staff is proportional to total headcount, the HR staff ratio does not depend on headcount. However, large organisations generally enjoy economies of scale (Thompson and Formby 1993). Up to a point, larger organisations allow greater specialisation in the use of HR staff. In addition, the greater the volume of HR activities and the more intensive the utilisation of automated facilities, the lower are fixed costs per HR staff member, because the fixed investment costs of capital-intensive techniques are being spread out over larger number

of employees. For example, wage administration, recruitment and training can be more efficiently organised when more employees are involved. This reasoning is in line with previous descriptive studies that distinguish between organisations of different size. Studies indicate that the ratio is much smaller for large organisations. For example, in the United States, the median ratio is estimated to be 0.017 among firms with fewer than 250 employees, and 0.012 among companies with 250 to 499 employees. Ratios of HR staff to total employment sector are substantially lower in organisations with 500 to 2,499 employees (0.008), and lowest among employers with 2,500 or more workers (0.006). (Bureau of National Affairs, 1992; Schuler and Hubert, 1993 p.26). Consequently,

*Hypothesis 1: The HR staff ratio is negatively related to the organisation's headcount.*

The National Context. Organisations face different legal and regulatory systems, culture and history depending on the country of residence. These legal and regulatory systems vary immensely between countries. For example, significant national differences exist in the legal requirements which apply when organisations lay employees off or employ temporary employees; very different legal regimes cover the recognition of trade unions, the requirement to have works councils; etc. This may explain why the country factor is, in Europe, usually the most significant explanatory variable of HR practices (Brewster and Hegewisch, 1994). Legal and regulatory systems have been shown to affect the HR function. Nevertheless, in general, it is difficult to foresee which legal and regulatory systems require more HR staff. We propose therefore the following weak hypothesis on countries:

*Hypothesis 2a: HR staff ratio is related to the legal and regulatory systems and is therefore country-dependent.*

There exist large cultural differences between countries. Hofstede (1980) identifies four dimensions of culture, of which one dimension ("Uncertainty Avoidance") emphasises that societies differ with respect to formalization and standardisation of work organisation. In societies which have a high degree of Uncertainty Avoidance people feel uncomfortable in unstructured or risky situations. In societies that prefer more formalization and standardisation of work, the advantages of using HR staff are larger. Thus, we propose therefore the following stronger hypothesis on countries:

*Hypothesis 2b: HR staff ratio is higher in countries in which formalisation and standardisation of work organisation is more common.*

Industry. Neo-classical economic theory supposes that competing organisations tend to similar labour practices. Since organisations mainly compete with other organisations within the same industry, the use of HR staff depends on the type of industry. In addition, the nature of competition varies particularly between industries (Porter, 1986). The nature of competition places different demands on the human resources needed to implement the strategy that integrates the activities of the organisation. The following three examples are relevant.

In fast-developing technology markets, such as mobile phones, the introduction of new products is vital to the organisation to survive. The development of new products into the market generally requires large investments in the training of employees. The benefits of the training are lost to the organisation when the employees (voluntarily or involuntarily) leave the organisation. Consequently, organisations will pursue a human resource strategy of low staff turnover, job rotation and effective screening of applicants (Milgrom and Roberts, 1993). Such a human resource strategy may require an intensive use of HR staff.

In the services sector, direct contact between employees and customers is more common and more important than in the manufacturing sector. As a result, organisations in the service sector compete with each other on how customers perceive this contact. Satisfied employees are more likely to help customers in a satisfying way. One way to satisfy employees is to pay them higher wages, but it may be more economical for the organisation to supply a more substantial HR service. Hence, in the services sector, HR staff ratios are higher than in the manufacturing sector.

Many large hotel chains strongly compete on costs, since the services they deliver are very similar. The internal labour market of these hotels is characterised by low skill requirements, and minimal hiring and training costs. Due to low monitoring costs, underperforming employees are easily detected. Accordingly, hotels have little incentive to invest in their human resources and the number of HR staff will be low. Accordingly:

*Hypothesis 3a: The type of industry is a determinant of HR staff ratio.*

The convergence thesis argues that the context of industry will eventually operate independently of national culture and, in fact, predominate over it due to pressures of competition. Thus, organisations are becoming increasingly alike in terms of strategic implementation, structure, technology, levels of bureaucratisation, HRM policies and practices and role of HRM function (Sparrow and Hiltrop, 1994). If this is true, then the industry in which an organisation operates must be of more importance than the country it resides in. Thus, application of the convergence thesis results in the following hypothesis:

*Hypothesis 3b: The type of industry is a more important determinant of HR staff ratio than country of residence. Thus, a higher proportion of the variation in HR staff ratio is explained by type of industry than by country of residence.*

Multinational Enterprises. A large number of studies argue that the internal organisation and human resource management of subsidiaries in multinational enterprises is different from other enterprises due to the cultural, juridical and political differences between nations. Internal co-ordination and control are particularly important for multinational enterprises (Martinez and Jarillo, 1989). One method of controlling subsidiaries in multinational enterprises is via human resource management (Edstrom and Galbraith, 1977, Brewster and Scullion, 1997). It is useful to distinguish between headquarters and subsidiaries. Rosenzweig and Singh (1991) argue that subsidiaries of multinational

enterprises face dual pressures: isomorphism with the local institutional environment, and consistency within the organisation. We argue that the dual pressures faced by subsidiaries of multinationals increase the number of HR staff in these subsidiaries, since HR staff in these subsidiaries have to deal also with the cultural, juridical and political differences between the subsidiary and the headquarters. Therefore

*Hypothesis 4: The HR staff ratio is higher in subsidiaries of multinational enterprises than in other subsidiaries.*

Labour intensive organisations. Industries are often categorised as being labour or capital intensive. The study by Walker (1980), based on seven major corporations in the US, suggests that the HR staff ratio is *less* in labour intensive sectors. This seems plausible. In labour intensive organisations, in which revenue per employees is lower than in capital intensive organisations, the marginal increase in revenue of one additional HR staff must be less than in capital intensive organisations.

*Hypothesis 5: The HR staff ratio is lower in labour intensive organisations.*

Training. Our definition of HR staff includes employees that deal with training. Therefore, one expects that:

*Hypothesis 6: the HR staff ratio is higher for organisations that offer more training activities to their workforce.*

The nature of the workforce. The number of HR staff may depend on the characteristics of the organisation's workforce. We will deal here with the proportion of part-time employees, temporary employees, fixed-term employees and female employees (temporary employees are employees who are recruited to do a job for an unspecified period of time; fixed-term employees are workers who are recruited for a specified employment period). In Europe, the difference between, on the one hand, temporary and fixed-term contracts and, on the other hand, permanent contracts is more relevant than in, for example, the United States, partly due to the high costs of terminating employment contracts. In the current context, the main difference between fixed-term employees and employees with permanent contracts is that the former have higher turnover. So, we hypothesise that the direction of the effect of the proportion of fixed term employees on the HR staff ratio is identical to the direction of staff turnover. Since HR staff deal with the hiring and firing of staff, one is inclined to suppose that organisations use more HR staff when staff turnover is higher. On the other hand, organisations have an incentive not to invest in the employment relationship, when the period during which the investment must be paid back is too short. For example, organisations that face high staff turnover are less likely to screen applicants effectively and less likely to offer training (Royalty, 1996). A priori, the relationship between staff turnover and the HR staff ratio is ambiguous. Hence, the relationship between the proportion of fixed term employees and staff turnover on one hand and the HR staff ratio on the other hand is ambiguous.

Temporary employees. The turnover of temporary employees is obviously higher than

that of other employees. In addition, temporary employees are often, though not exclusively, recruited via recruitment agencies (Russo, 1996). We presume that the use of recruitment agencies reduces the need for HR staff (when we control for staff turnover). Consequently,

*Hypothesis 7: The HR staff ratio decreases with the proportion of temporary employees.*

Part-time employees. We hypothesise that full-time employees get more HR support than part-time employees, because the beneficial effects of HR support per working hour are higher for full-time employees. As a result, organisations are likely to provide full-time employees with more training and spend more resources on career development and performance appraisal. So:

*Hypothesis 8: The HR staff ratio decreases with the proportion of part-time employees.*

Female employees. The effect of the proportion of female employees on the HR staff ratio is potentially minimal. Although, in theory, more HR staff are needed to deal with maternity leave, in-company nurseries etc., this effect must be negligible in practice. Therefore:

*Hypothesis 9: The HR staff ratio is not affected by the proportion of female employees.*

Group size. Many organisations in the economy are not independent single-site

organisations, as they belong to a group of organisations. When organisations within one group do not operate independently, the HR function can be used to increase internal coordination and control within the group, as suggested by agency theory and human resource management theories. This indicates that organisations that belong to larger groups have higher HR staff ratios.

*Hypothesis 10: the HR staff ratio is higher for organisations that belong to larger groups.*

Centralisation and decentralisation of HR policies. When an organisation is part of a larger group of organisations, HR policies can be determined at different locations within the group. The group can choose to centralise HR policies at the headquarters. The main advantage of centralisation is that policies can be standardised within the group; which may, for example, facilitate job movements from one organisation to another organisation within the same group. Nevertheless, it may lead to increased bureaucracy and the use of more HR staff. Thus, we formulate the following hypothesis:

*Hypothesis 11: the HR staff ratio increases with the degree of centralisation of HR policies within the group.*

Devolvement of the HR function. A number of studies have recently pointed out that some of the traditional HR activities have been assigned to line management (Brewster et al., 1997) Clearly, devolvement of HR responsibilities to line managers generally

decreases the number of HR staff needed. Although some have argued that more HR responsibility for line management may imply the need for more HR staff due to increased control activities by HR staff (Walker, 1988), our evidence that a key motivator for devolvement to the line being the reduction of costs (Brewster et al., 1997) means that we think this is less likely:

*Hypothesis 12: the HR staff ratio is lower when HR responsibility is transferred to line management.*

Job rotation. Job rotation implies a change of workplace by transferring employees between various areas of responsibility. Job rotation is generally discussed as a special form of functional flexibility, the process of increasing the skills of employees in such a way that the employees acquire the capacity to work across traditionally distinct occupational boundaries (Cordery, 1989, Friedrich et al., 1998). Job rotation is more common in large organisations, in the manufacturing sector (Friedrich et al, 1998), and in Japan (Milgrom and Roberts, 1993). The advantages of job rotation have been spelt out in the literature (Cordery, 1989, Friedrich et al., 1998, Milgrom and Roberts, 1993). For example, job rotation enables organisations to respond more effectively to changes in the external environment and gives employees greater security of employment. Furthermore, by taking over new tasks and by exercising functions independently, the employees' knowledge and abilities are enhanced. Typically, job rotation makes an organisation more attractive as an employer, reduces staff turnover, and may reduce the cost of supervision and recruitment. In addition, job rotation makes it more worthwhile for organisations to

invest in their employees (Friedrich et al. 1998). Of course, the advantages of job rotation for organisations and employees materialise particularly when staff turnover is low (Milgrom and Roberts, 1993). Job rotation goes along with systematic personal planning and induces a variety of tasks for the human resources department. Suitable posts have to be identified and remuneration packages have to be adapted. Moreover, resistance shown by line managers, who encounter lower productivity at the beginning of each rotation, has to be countered (Friedrich et al., 1993). When the incentives of the line managers are not aligned with those of the organisation, HR staff are especially needed.

*Hypothesis 13: the HR staff ratio is higher when organisations use job rotation.*

HR strategies. HR strategies can be used to generate comparative advantage, since these strategies are relatively difficult to copy by other organisations. Variations in HR strategies will also have an effect on the number of HR staff needed. Implantation of any HR strategy will require additional HR staff. Plausibly, the more attention these HR strategies receive at the highest decision-making level in the organisation, the more HR staff are needed, since HR strategies are more likely to be fully integrated in the overall business strategy. One way to measure how much attention HR strategies receive at the highest decision-making level is by observing whether the head of the HR department is on the Board of Directors. It seems likely that when the head of the HR department has a place on the Board of Directors, HR strategies will receive more explicit attention within the overall business strategy. Hence:

*Hypothesis 14a: the HR staff ratio is higher for organisations that have an HR strategy.*

*Hypothesis 14b: the HR staff ratio is higher when the head of the HR department is on the Board of Directors.*

Unionisation. There is little existing theory about the relationship between unionisation and the size of the HR department. Walker (1988) argues that the effect of unionisation on the number of HR staff is theoretically ambiguous: union presence may require more HR staff in order to manage that relationship; on the other hand unions may do some of the work normally associated with the HR function - the "managers of discontent" role (Watson). It is likely that the presence of union members is in itself unclear, therefore. However, a critical issue concerns the recognition for collective bargaining purposes of the union (Morley et al., 1999). This may mean that the organisation has to pay more attention to these issues and hence needs more specialist staff. Hence,

*Hypothesis 15a: The HR staff ratio is not affected by the degree of unionisation.*

*Hypothesis 15b: The HR staff ratio is increased by union recognition*

### **3. THE EMPIRICAL ANALYSIS**

In this section, we will discuss the data, the construction of the dependent variable and independent variables.

#### **The Data**

The data employed in this paper are from the repeating Cranet-E survey, which now contains evidence on human resource management issues of private and public organisations in 22 European countries (Brewster et al. 1996). The data set used in this paper contains the first 14 countries to report in 1995. The data is broadly representative with respect to the industrial sector in every country. The data is not evenly distributed over the countries, however. Though we have for every country at least hundred observations, more than 40% of the observations come from the UK or Denmark. So, though the survey is representative for the countries included in the survey, the survey is not representative for Europe.

The survey targets organisations that employ more than 200 employees. In a few smaller countries however, the survey targets organisations that employ more than 100 employees: about 20% of the observations in the survey involve organisations that employ less than 200 employees (and these have been included in the current paper). About 70% of the observations of the survey have been completed by the most senior personnel or human resource manager. The other observations involve less senior specialists in the same field. Occasionally, the questionnaire has been answered by the chief executive or the company secretary.

The data set contains 6306 observations in total. Not all organisations employ specialised human resource management staff (small organisations particularly may not employ this type of staff). In our data set, 89% of all organisations have a personnel /human resource management department or a personnel/human resource manager (5619 organisations). If the

organisation has such a department or manager, a question has been asked about the number of persons employed in the personnel/human resources function, including wage administration and training (5436 valid observations). Given information on the total headcount, we have calculated the HR staff ratio (5352 valid observations). A first explanatory analysis indicates that some organisations report more HR staff than total headcount. These organisations are, of course, excluded from analysis, since an error must be involved. Furthermore we have excluded 28 organisations with a reported ratio of HR staff to total headcount of more than 0.1. This extremely high number of HR staff is likely due to measurement error. The choice to exclude these organisations is arbitrary to a certain extent.

In the empirical analysis, we use the ratio of HR staff to total headcount as the dependent variable. The average value of the HR staff ratio is 0.015. Thus, on average, per 1000 employees, 15 HR staff are employed. Such a number may be misleading, since the variation in the value of the HR staff ratio is extremely large (the standard deviation of the ratio is 0.11) caused by a few extremely small and large values (the extreme values may be due to misunderstanding of the question or wrongly processed data). Therefore, we have recalculated the trimmed mean, excluding observations with the 5% largest and 5% smallest values. The trimmed mean is then 0.013. Thus, per 1000 employees, about 13 HR staff are employed.

In the calculations of HR staff ratio, we have excluded organisations that have no HR department or HR managers (mainly relatively small organisations), however these

organisations may have some HR staff that are not organised in the HR department. Organisations without HR department or HR managers are likely to have less HR staff, which suggests that our mean may be over-estimated. Clearly, when these organisations have no HR staff, then the bias obtains its maximum value. So we may examine the maximum potential bias in the estimates by calculating the HR staff ratio while presuming that organisations without HR department or HR manager have no HR staff at all. It appears then that the estimated mean of the HR staff ratio is equal to 0.013. Hence, our calculation of the mean is quite robust.

Furthermore, we calculated that the median HR staff ratio is 0.12. The variation in the data is relative small for about half of the organisations: half of the organisations have a HR staff ratio between 0.008 and 0.018. Thus, despite the differences in country of residence, sector, size etc., the variation in HR staff ratio is relatively small for a large share of organisations. On the other hand, 5% of the organisations have a HR staff ratio of less than 0.004 and 5% of the organisations have a HR staff ratio of more than 0.04, a difference of a factor ten. One of the objectives of this paper is to explain the large variation in HR staff ratios.

INSERT TABLE 1

### **The dependent variable**

To identify the determinants of HR staff, we use as dependent variable, the logarithm of the HR staff ratio. To explain the observed variation in this dependent variable a regression model is estimated. An advantage of the regression model, particularly important in the current application, is that the analysis is insensitive to at random

measurement errors in the dependent variable.

### **The independent variables**

The Cranet-E survey contains a large number of exogenous variables that may explain the variation in the incidence of the HR staff ratio (see appendix 1 for the means of these variables). The size of the organisation and the size of the group are measured by the logarithm of the number of employees in the organisation and in the group respectively (*H1* and *H10*). We use 12 country dummies, and a dummy that distinguishes between the western and eastern parts of Germany. The UK is the country of reference (*H2*).

We distinguish between 16 different sectors. For example, we distinguish between different types of government organisations (central and local), different types of service organisations (e.g. banking and health services) and different types of manufacturing organisations. Organisations in metal manufacturing or mechanical engineering are in the reference group (*H3*).

In addition, we include dummy variables for corporate headquarters of international groups, corporate headquarters of national groups, subsidiaries/divisions of international and national groups, independent single site organisations and independent organisations with more than one site. Other organisations and organisations for which the type is unknown are the reference category (*H4*). Initially, we do not distinguish between subsidiaries according to foreign ownership. In subsequent analysis, we will distinguish according to 4 types of foreign ownership (European ownership, American ownership,

Japanese ownership and rest of the world ownership). In addition, the proportion of turnover spent on wages is used as a measure to capture whether the organisation is labour intensive (*H5*). Furthermore, we include the logarithm of wages spent on training (*H6*).

A variable that captures different categories of staff turnover is defined as follows: 1: less than 2%; 2: 2-5%; 3: 5-10%; 4: 10-20%; 5: 20-30%; 6: more than 30%. The proportion of temporary employees and the proportion of employees on a fixed-term contract are measured as follows: 0: none; 1: less than 1%; 2: 1-5%; 3: 5-10%; 4: 10-20%; 5: more than 20% (*H7*). The proportion of part-time employees and the proportion of females are included as continuous explanatory variables (*H8* and *H9*).

Centralisation of the HR policies is assessed by an index which measures where in the group HR policies are determined. This index is based on answers to questions about where in the group six types of policies are mainly determined (policies regarding pay and benefits; recruitment and selection; training and development; industrial relations; health and safety; workforce expansion/reduction). This index is calculated only for organisations that are part of a larger group of companies/divisions (a low number indicates that the policies are determined at the headquarters, a high number indicates that the policies are determined on site). The index for organisations which are not part of a larger group are set to the mean of the index (*H11*).

We include also an index which measures whether the primary responsibility for major

policy decisions regarding the six types of policy areas mentioned above lies with line management or with HR staff (a low number indicates that line management is fully responsible) (*H12*). In addition, a dummy is included that measures whether the organisation regularly makes use of job rotation (*H13*). We have measured the effect of the HR strategy in two different ways: dummies for the presence of a written personnel/HR management strategy and an unwritten personnel/HR management strategy (*H14a*) and a dummy whether the head of HR has a place on the Board (*H14b*).

Finally, in order to control for the effect of unions on the HR staff ratio, two variables are used. One variable that measures the unionisation of the workforce (percentage of the workforce that are member of an union), defined as follows 1: 0%; 2: 1-25%; 3: 26-50%; 4: 51-75%; 5: 76-100%. Another variable measures whether the organisation recognises the union (in Germany, Sweden, Finland and France all organisations included in our survey are required to do so).

A number of studies have recently emphasised that it is not enough to discuss significance levels, since statistical significance is not a meaningful measure of the strength of the relationship between variables (for example, McCloskey, 1985). Therefore, when we interpret the results of the model, we emphasise the magnitude of the effects. We distinguish here between continuous, discrete and index variables. In the case of continuous explanatory variables (for example, the proportion of females in the workforce), it is useful to report the elasticity of the HR staff ratio with respect to the continuous explanatory variables. The elasticity is defined as the percentage change in

HR staff ratio given a percentage change in the explanatory variable. The elasticities reported here are evaluated at the mean of the continuous explanatory variables. In the case of discrete explanatory variables (for example, the proportion of the workforce that is member of a union, measured in categories), we report the percentage change in HR staff ratio given that the explanatory variable increases one unit, evaluated at the mean of the explanatory variable. In the case of discrete explanatory variables that can only obtain the values zero and one (for example, country and industry variables), we report the percentage change in HR staff ratio given that the explanatory variable increases from zero to one. In cases of index variables, we report the change in HR staff ratio given an increase of one standard deviation of the index variable.

### **3. EMPIRICAL RESULTS**

Empirical estimates of the regression model are shown in the second column of Table 1. The  $R^2$  is equal to 0.25. Consequently, from a practitioners' point of view, the regression model used in this paper is quite useful as a tool for explaining the observed variation in the size of the HR departments (one has to keep in mind that  $R^2$  is a measure of fit and not a measure of the appropriateness of the assumptions underlying the empirical specification). The correlation between the observed (logarithm of the) HR staff ratio and the predicted (logarithm of the) HR staff ratio using the regression model is equal to 0.5.

Many explanatory variables in the regression model are statistically significant at conventional significant levels. Using a F-test, the hypothesis that the explanatory variables as a group are not statistically significant is rejected ( $p < 0.0001$ ). In the current

study, we have used a sample of 5359 observations of organisations. It is sometimes believed that such a large sample renders statistically significant effects for all explanatory variables given conventional significant levels (1%, 5% or 10%). This belief however falls, particularly when the number of explanatory variables is large. In the current study, about half of the explanatory variables are not significant at 5% significance levels using a (two-sided) t-test.

In the theoretical part of the paper, we have hypothesised that the HR staff ratio is a decreasing function of the number of employees (*HI*). This hypothesis is not rejected by the data (to be more precise, the null-hypothesis of no relationship between the HR staff ratio and the number of employees is rejected against the hypothesis of a negative relationship; in the latter part of the paper, we will use the phrase 'the hypothesis is not rejected' in a similar loose sense). The size effects are large. The estimated sign of the logarithm of total headcount is equal to -0.242, and statistically significant ( $p < 0.001$ ). The elasticity of the HR staff ratio with respect to total headcount is then equal to -0.242. Although it is unwise to attach too much value to the point estimate of the effect of an explanatory variable based on one specific study, we believe that given the large number of observations in the current study and the representativeness of our sample, our estimate is accurate. Thus, as a rule of thumb, an increase in total headcount of 1% would, on average, induce a decrease in the HR staff ratio of about 0.24%. In other words, an increase in total headcount of 1% would induce an increase in the *number* of HR staff of about 0.76%.

The size of the organisation, measured in terms of headcount, is the most important predictor of the HR staff ratio. To facilitate the interpretation of the effect of the size of the organisation on the HR staff ratio, we have re-estimated the regression model including 4 explanatory variables that measure differences in categories of headcount (less than 200 employees, between 200 and 500 employees, between 500 and 1000 employees and more than 1000 employees) while excluding the logarithm of total headcount. According to the results (which are not shown here), organisations with more than 1000 employees have approximately 71% lower HR staff ratios than organisations with less than 200 employees, 37% lower HR staff ratios than organisations with more than 200 employees and less than 500 employees, and 24% lower HR staff ratios than organisations with more than 500 employees and less than 1000 employees. These results are in line with previous studies that do not control for a range of explanatory variables (Schuler and Hubert, 1993 p. 26).

Our second result is that the HR staff ratio depends on the country of residence of the organisation. For example, organisations in Germany have at least 30% more HR staff than in Finland. The country variables are statistically significant determinants of HR staff as a group, using the standard F-test ( $p < 0.01$ ). Hence, we do not reject the (weak) country hypothesis *H2a*. Nevertheless, the differences in HR staff ratios between most European countries are minor (and statistically insignificant at any conventional significance level). In particular, the differences in HR staff ratios between the Netherlands, Sweden, Denmark, Belgium, Switzerland, Italy and Turkey are extremely minor (less than 10%), although these countries are very different in many aspects (for

example, culture, labour laws, GDP).

Hofstede (1980) has created an index that measures differences in cultures with respect to formalisation and standardisation of work organisation. Our results do not suggest that in countries in which formalisation and standardisation of procedures is less common (for example, the United Kingdom and Denmark), HR staff ratios are lower than in countries where this is very common (for example, Belgium and Turkey). Thus, we reject *H2b*. Looking for a pattern, the data suggest that in North European countries, HR staff ratios are lower. This may be linked with a more strategic and less administrative function in those countries (Brewster and Holt Larsen 1999) but more research is needed to clarify the reasons for this pattern.

We have hypothesised that the number of HR staff depends on the type of industry (*H3a*). We do not reject this hypothesis. Our study shows that central government organisations have (much) higher HR staff ratios than other organisations. For example, central government organisations use 23% more HR staff than organisations that are in banking, finance or business services (the difference is even higher compared to other industries). We offer a number of explanations for this result. It may indicate that central government organisations operate inefficiently, since they do not operate in a competitive environment. An alternative explanation is that central government organisations efficiently provide more HR services than private organisations. It has been argued that governmental organisations are concerned with the welfare of the public, which includes their own employees. As a consequence, they act as exemplars of good practice and offer

more HR services than required by a competitive labour market. This argument cannot fully explain however why central government organisations have higher HR ratios than local government organisations.

Our findings indicate that organisations in the services sectors have higher HR ratios than those in the manufacturing sectors. HR staff ratios are however the lowest in the retail, hotel and distribution sector, even (somewhat) less than in manufacturing industry. All the 15 sector variables are statistically significant as a group, using an F test ( $p < 0.001$ ). Thus we may conclude that hypothesis *H3a* cannot be rejected: industry is an important predictor of the HR staff ratio.

We have hypothesised that the sector is a better predictor of HR staff than country (*H3b*). We have tested this hypothesis by calculating the variation in HR staff explained by the country variables and the variation in HR staff ratio explained by the sector variables, while controlling for all other characteristics. It appears that the sector variables explain an additional 4.1% of observed variation in HR staff, whereas country explains only an additional 1.1% of the observed variation in HR staff. Thus, *H3b* is not rejected.

We hypothesised that subsidiaries of multinational organisations have larger HR departments (*H4*). The results indicate however that subsidiaries of international and national groups have HR staff ratios which are about equal. This demonstrates that the dual pressures on subsidiaries of multinational enterprises is not strong enough to increase the number of HR staff. To investigate this issue further, we have re-estimated

the model using only information on subsidiaries in the private sector. In addition, we distinguish now between subsidiaries of domestic organisations, Japanese organisations, American organisations, European foreign-owned organisations and other organisations (rest of the world). These results can be found in Table 1 (it appears that the results are similar for most explanatory variables indicating that the results are robust). Interestingly, the country of origin has some effect on the HR staff ratio. The data suggest that, within Europe at least, subsidiaries of European organisations have smaller HR departments than those of non-European organisations. HR staff ratios in subsidiaries in Japanese, American and other non-European organisations are about 9-10% larger than subsidiaries in European organisations. Nevertheless, the data also indicate that subsidiaries of European organisations have smaller HR departments than subsidiaries of domestic organisations.

We have argued that in labour-intensive industries, HR staff ratios are lower (*H5*). This hypothesis is confirmed by the data. The estimated coefficient related to the proportion of turnover spent on wages is equal to -0.170 (and is statistically significant). The elasticity of the HR staff ratio with respect to the proportion of turnover spent on wages is equal to -0.062. Thus, an increase in the proportion of turnover spent on wages from 30% to 40% decreases the HR staff ratio with approximately 1.72%. This result implies that HR staff ratios are about 14% higher in the most capital-intensive industries (proportion of turnover spent on wages is less than 10%) compared to the most labour-intensive industries (proportion of turnover spent on wages is more than 90%).

The results indicate that when organisations offer more training to their workforce, HR staff ratios are higher. Thus, we do not reject *H6*. The estimated coefficient of the proportion of wages spent on training is equal to 0.053 (and is statistically significant). The elasticity of the HR staff ratio with respect to the proportion of wages spent on training is then equal to 0.053. This implies that an increase in the proportion of wages spent on training from 30% to 40% increases the HR staff ratio by approximately 1.47%.

We have argued that the sign of the effect of staff turnover and the proportion of employees on fixed-term contracts is ambiguous. It appears that the effect of (categorised) staff turnover on the HR staff ratio is negligible (and statistically insignificant). For example, the results suggest that an increase in staff turnover from 2% to 5% increases the HR staff ratio by about 0.04%. Nevertheless, the coefficient of the (categorised) proportion of employees on fixed-term contracts is positive and equal to 0.013 (significant at the 5% level). The magnitude of this effect is, however, not small: the result implies that an increase in the proportion of fixed-term employees of 5% to 10% increases the HR staff ratio with approximately 1.3%. We have also hypothesised that organisations with more employees on temporary contracts are more likely to have less HR staff (*H7*). This is weakly confirmed by the data. The coefficient of the (categorised) proportion of temporary employees is equal to -0.012, but it is not statistically significant. The magnitude of the effect is also small: the result implies that an increase in the proportion of temporary employees of 5% to 10% decreases the HR staff ratio by approximately 1.2%.

It is not clear to us why the effects of staff turnover and the proportion of employees on temporary and fixed term contracts are different. One explanation may be that staff turnover can be decomposed into employee-initiated staff turnover (termination of contract by employee) and organisation-initiated staff turnover (termination of contract by organisation). Temporary contracts may be employee or employer initiated. The use of fixed term contracts may be strongly related to organisation-initiated staff turnover, and not related to employee-initiated staff turnover. Employee-initiated staff turnover may have a positive affect on the number of HR staff due to attempts of the organisation to reduce staff turnover, whereas organisation-managed staff turnover has a negative effect on the number of HR staff. Since we do not distinguish in our empirical analysis between employee-initiated staff turnover and organisation-initiated staff turnover, it may be case that the positive effect of employee-initiated staff turnover and the negative effect of organisation-initiated staff turnover cancel out, such that the effect of staff turnover is negligible. More research is needed here.

We have also hypothesised that a higher proportion of part-timers in the workforce would lead to lower HR staff ratios (*H8*). This hypothesis is confirmed by the data. The coefficient of the proportion of part-time employees is equal to -0.313 (and is statistically significant). This implies that the elasticity of the HR staff ratio (evaluated at the mean) with respect to the proportion of part-time employees is equal to about -0.041. This implies that an increase in the proportion of part-time employees from 10%-20% decreases the HR staff ratio by approximately 3.2%. It seems plausible to suggest that organisations that have more part-time employees are also more likely to have more part-

time HR staff, hence the interpretation of this effect is not unambiguous (the data does not allow us to distinguish between full-time and part-time HR staff).

We have hypothesised that there exists no relationship between the proportion of females and the HR staff ratio (*H9*). This hypothesis cannot be rejected. The coefficient of the proportion of females is small and statistically insignificant. The estimated coefficient implies that the elasticity of the HR staff ratio (evaluated at the mean) with respect to the proportion of female employees is equal to approximately -0.016. This means that an increase in the proportion of female employees from 40 to 50% decreases the HR staff ratio by approximately 0.4%.

The results convincingly show that the effect of the size of the group the organisation belongs to has a positive effect on the HR staff ratio (*H10*), as hypothesised. The magnitude of the effect is small: an increase in the size of the group of 1% increases the HR staff ratio with about 0.024%. The absolute value of the magnitude of the effect of the size of the *organisation* is about ten times larger than the magnitude of the effect of the size of the *group*. Hence, it is efficient for larger organisations to take care of (some of) the HR functions for other smaller organisations within the same group, since larger organisations enjoy more economies of scale.

In line with the hypothesis, decentralisation of HR policies decreases the use of HR staff (*H11*). The magnitude of this effect is not so large (the coefficient of the index is equal to -0.005): an increase of two standard deviations in the index which measures where HR

policies are determined decreases the HR staff ratio with about 3.0%. In addition, as hypothesised, devolvement of HR responsibilities to the line, decreases the number of HR staff used (*H12*). The magnitude of this effect is large (and is highly statistically significant). The estimated coefficient of the index that measures whether the responsibility lies with the HR staff or with line management is equal to 0.014. An increase of two standard deviations in the index decreases the HR staff ratio with about 10%.

We find that job rotation increases the use of HR staff, in line with our hypothesis (*H13*). The magnitude of the effect is quite large: organisations that make use of job rotation use about 8.8% more HR staff.

As hypothesised, we find that when the head of HR is on the board of directors, and when the organisation has a (written) HR strategy, the ratio is higher (*H14*). The results indicate that when the head of HR is on the board, the ratio increases by about 9.6%. Organisations with a written HR strategy have a HR staff ratio which is about 11% higher and those with an un-written HR strategy have a HR staff ratio which is about 5.4% higher than organisations without any HR strategy.

The effect of union involvement is slightly ambiguous. The evidence demonstrates that unionisation increases the HR staff ratio, and the magnitude of the effect is reasonably large. Fully unionised organisations have HR staff ratios that are approximately 6.4% larger than non-unionised organisations. However, the results indicate that recognition of

unions does not have any effect on the size of the HR department. Thus, the presence of unions affects the size of the HR department, but recognition does not. Both our hypotheses here have to be rejected. More research is needed to explain this finding.

Finally here, we have re-estimated the model using only data on independent organisations in the private sector (see Table 1). The advantage of focusing on this type of organisations is that their organisational structure is less complicated, so it is less likely that the effects reported above are spurious, caused by the difficulty of controlling for organisational structure. The disadvantage of course is that we deal with fewer organisations increasing the effect of random factors on our estimates. It appears that the results do not change to any great extent. Summarising, we find that most hypotheses are confirmed by the data indicating that organisational characteristics affect the size of HR departments in a way that is consistent with current organisational theoretical thinking. The effects of most determinants are not only statistically significant, the magnitude of the effects are fairly large and robust with respect to a number of specifications.

#### **4. CONCLUSION**

We have analysed the determinants of the HR staff ratios in organisations across Europe using a survey targeted at human resource managers. We demonstrated that a large number of organisational characteristics affect the size of HR departments in line with current theoretical thinking. We have shown that the effects of the characteristics are not only statistically significant, they are also of large magnitude. The study shows that country of residence, but particularly sector and size, are the key determinants of

numbers of HR staff within an organisation. Other interesting findings are that in capital-intensive and more unionised organisations, organisations that use job rotation, subsidiaries of non-European companies and in organisations in which HR responsibilities are not transferred to line management, more HR staff are employed. We also demonstrate that organisations that have the head of a HR department on the Board and have explicit HR strategies have larger HR departments.

One major limitation of the current study is that we do not control for employee categories such as management, professional employees, manual employees and for the educational level of employees. Similarly, we are unable to say anything about the effect of subcontracting of the HR work on the numbers of HR staff or about the proportions of full and part time workers in the HR department itself. We are at present in the process of collecting data to investigate these issues further.

The evidence presented in this paper has both practical and theoretical implications. Theoretically, the study proposes a number of hypotheses on HR staff ratios, and tests these hypotheses. This takes us beyond previous, anecdotal, evidence in addressing this issue. Practically, it provides a framework to help organisations see where they stand in terms of the size of their HR function compared to similar organisations.

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## Appendix

INDEPENDENT VARIABLE	mean	s.d.
Ratio HR staff	0.015	0.011
Size of organisation	1848	7976
Size of group (divided by thousand)	43.16	137.33
Part-time	0.13	0.18
Temporary	1.79	1.24
Fixed-term	1.77	1.36
Females	0.39	0.25
Unionisation	3.1	1.68
Recognition of union	0.76	0.43
Head of HR on Board	0.58	0.49
HR strategy (written)	0.46	0.50
HR strategy (unwritten)	0.30	0.46
HR policies determined on site (index)	0	3.18
Responsibility lies with HR staff (index)	0	3.92
Proportion of turnover spent on wages	0.36	0.24
Staff turnover	2.52	1.26
Job rotation	0.20	0.40
Proportion of wage spent on training	0.37	0.27
Corporate headquarters of international group	0.08	0.28
Corporate headquarters of national group	0.07	0.26
Subsidiary/division of international group	0.25	0.43
Subsidiary /division of national group	0.10	0.29
Independent single site organisation	0.11	0.31
Independent company with more than one site	0.16	0.36
Other organisations (e.g. hospitals, public organisations)	0.23	0.41
Subsidiary/division of domestic organisation	0.10	0.29
Subsidiary/division of Japanese organisation	0.01	0.09
Subsidiary/division of USA organisation	0.07	0.25
Subsidiary/division of European organisation	0.13	0.34
Subsidiary/division of organisation in rest of world	0.01	0.09

**Table 1**

INDEPENDENT VARIABLE	All Data	SUBSIDIARIES	INDEPENDENT
<b>COUNTRIES</b>			
Germany (West)	0.086* (0.035)	-0.026 (0.057)	0.121 (0.075)
Germany (East)	0.013 (0.047)	-0.005 (0.059)	0.024 (0.083)
United Kingdom (reference)			
France	-0.054 (0.035)	0.031 (0.063)	-0.002 (0.062)
Spain	-0.063 (0.044)	-0.042 (0.067)	-0.146* (0.095)
The Netherlands	-0.105* (0.039)	-0.166* (0.059)	-0.066 (0.083)
Switzerland	-0.121* (0.043)	-0.157* (0.065)	0.020 (0.096)
Sweden	-0.129* (0.039)	-0.153* (0.052)	0.017 (0.106)
Denmark	-0.160* (0.032)	-0.202* (0.055)	-0.012 (0.066)
Belgium	-0.163* (0.037)	-0.123 (0.050)	-0.131 (0.085)
Italy	-0.178* (0.063)	0.001 (0.175)	-0.155 (0.088)
Turkey	-0.186* (0.049)	-0.086 (0.088)	-0.059 (0.079)
Norway	-0.218* (0.035)	-0.184* (0.053)	-0.099 (0.094)
Ireland	-0.286* (0.039)	-0.150* (0.057)	-0.426 (0.079)
Finland	-0.323* (0.041)	-0.382* (0.067)	-0.223* (0.088)
<b>SECTOR</b>			
Central Government	0.511* (0.052)	Excluded	Excluded
Banking; finance; business services	0.283* (0.033)	0.287* (0.051)	0.258* (0.063)
Energy and water	0.263* (0.045)	0.299* (0.072)	0.238* (0.077)
Chemical products; extraction of non-energy minerals	0.201* (0.038)	0.188* (0.046)	0.116 (0.084)
Education	0.194* (0.049)	0.319 (0.195)	0.167 (0.088)
Transport and communication	0.190* (0.041)	0.093 (0.059)	0.240* (0.080)
Other services (TV & radio, charities etc.)	0.180* (0.049)	0.181* (0.091)	0.187* (0.085)
'Other sectors'	0.117* (0.036)	0.030 (0.054)	0.065 (0.068)
Health services	0.100*	0.140	0.069

	(0.046)	(0.119)	(0.102)
Local government	0.044 (0.044)	Excluded	Excluded
Personal domestic, recreational services	0.032 (0.083)	0.214 (0.154)	0.098 (0.155)
Metal manufacturing, mechanical engineering (reference)			
Other manufacturing (textiles etc.)	-0.013 (0.027)	0.004 (0.035)	-0.023 (0.053)
Building and civil engineering	-0.068 (0.042)	-0.135* (0.061)	-0.094 (0.076)
Retail and distribution, hotels	-0.090* (0.038)	-0.104* (0.052)	-0.025 (0.072)
Size of organisation	-0.242* (0.007)	-0.203* (0.012)	-0.271* (0.015)
Size of group	0.024* (0.007)	0.020* (0.009)	-0.034 (0.019)
Part-time	-0.313* (0.060)	-0.405* (0.109)	-0.103 (0.113)
Temporary	-0.012 (0.007)	-0.017 (0.011)	0.009 (0.013)
Fixed-term	0.013* (0.006)	0.016 (0.011)	0.013 (0.012)
Females	0.040 (0.042)	-0.001 (0.068)	-0.063 (0.076)
Unionisation	0.016* (0.006)	0.015 (0.010)	0.024* (0.012)
Recognition of union	0.014 (0.026)	-0.019 (0.039)	0.012 (0.052)
Head of HR on Board	0.096* (0.017)	0.111* (0.026)	0.109* (0.034)
HR strategy (written)	0.114* (0.021)	0.124* (0.033)	0.117* (0.041)
HR strategy (unwritten)	0.054* (0.021)	0.076* (0.035)	0.057 (0.038)
HR policies determined on site (index)	-0.005* (0.002)	-0.011* (0.003)	-0.005 (0.006)
Responsibility lies with HR staff (index)	0.014* (0.002)	0.008* (0.003)	0.013* (0.004)
Proportion of turnover spent on wages	-0.172* (0.051)	-0.201* (0.081)	-0.188* (0.095)
Staff turnover	0.003 (0.059)	0.025* (0.086)	0.010 (0.119)
Job rotation	0.088* (0.019)	0.080* (0.029)	0.025 (0.041)
Proportion of wage spent on training	0.053* (0.010)	0.035* (0.015)	0.057* (0.019)
TYPE OF ORGANIZATION			
Corporate headquarters of international group	-0.022 (0.037)		
Corporate headquarters of national group	-0.091* (0.037)		
Subsidiary/division of international group	-0.050		

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	(0.030)		
Subsidiary /division of national group	-0.043		
	(0.034)		
Independent single site organisation	-0.067*		
	(0.032)		
Independent company with more than one site	-0.114*		-0.045
	(0.029)		(0.032)
Other organisations or missing information			
Subsidiary/division of domestic organisation			
Subsidiary/division of Japanese organisation		0.042	
		(0.084)	
Subsidiary/division of USA organisation		0.027	
		(0.038)	
Subsidiary/division of European organisation		-0.059*	
		(0.029)	
Subsidiary/division of organisation in rest of world		0.043	
		(0.097)	
R <sup>2</sup>	0.248	0.215	0.249
Number of observations	5352	2142	1446

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