

WERS 2004 Information and Advice Service Technical Paper No. 4

Spotlight on Five Question Areas in WERS 2004

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Introduction

The purpose of this paper is to provide a brief discussion of five areas of questioning in the 2004 Workplace Employment Relations Survey that were either new to the survey or in some way unusual. We present this discussion with three objectives in mind:

- a. To document the origins of particular questions, particularly those that had not previously been used in other surveys.
- b. To comment on the validity of the measures, emphasising any previous tests of item validity.
- c. To demonstrate how some of the more unusual questions in WERS may be analysed.

The paper covers the two major innovations to the structure of the survey, namely the introduction of the Financial Performance Questionnaire and the revisions that surrounded the surveying of worker representatives. It also covers three areas of questioning in the management and employee questionnaires, namely competitive strategies, computer use and wages.

These five areas represent only a subset of the innovations that took place in the development of WERS 2004. However, discussions of many of the other innovations can be found in Whitfield and Huxley (eds) (2007).

1. Financial performance

Origins:

There is a considerable body of work that employs data from the first four surveys in the WERS series to examine the extent to which different types of human resource management, employment practices and compensation systems impact upon workplace performance. Whilst the WERS series has been valuable in providing one of the few nationally-representative sources of survey data on workplace practices and workplace performance, the surveys have been criticised because they have historically measured performance by asking managers to provide subjective assessments of how levels of productivity and financial performance at their workplace compare with their competitors. The questions are directed to the management respondent towards the end of the two-hour face-to-face interview, with responses collected on a five-point scale ('a lot above average' to 'a lot below average').

These simple measures have two obvious advantages: first, they attract high response rates (around 90 per cent); and second, they add minimal cost to the survey budget, comprising only two short questions in a face-to-face interview that already lasts two hours. However, there are also a number of criticisms that might be leveled at the measures. First, there is a concern that many respondents to the survey may not be well informed about levels of productivity in their establishment: in around half of all establishments the respondent to the face-to-face interview is a professional personnel manager rather than a general manager or finance manager. This concern is seemingly given weight by the skewed nature of responses: few managers code their workplace as below average. A second concern is that the use of a five-point rating scale limits the degree of variance in establishment productivity that might otherwise be captured, for example, by a continuous accounts-based measure. A third concern is common-rater bias, since a single respondent provides information about both working practices and establishment performance. A fourth concern is that the measure lacks clarity, since the respondent is given no guidance on how to calculate 'labour productivity', nor are they asked how they defined their 'industry'.¹ Finally, the limited ordinal nature of the response categories means that one cannot quantify the impact of a particular workplace practice that has shown to be associated with the productivity rating (e.g. to say that it improves productivity levels by 5 per cent).

Past evaluations of the subjective ratings have been cautiously positive, showing for example that managers' ratings are correlated with the subsequent probability of workplace closure (Machin and Stewart, 1990, 1996; Bryson, 2001). However, the number and weight of concerns about the rating measures led to ongoing calls for WERS to collect some 'objective' or 'accounts-based' data on establishment performance.

An attempt to link WERS 1998 data to the Annual Respondents Database - a repository for the data collected in the various surveys undertaken by the Office for National Statistics, such as, and most importantly, the Annual Business Inquiry (ABI) - yielded a relatively small number of linked observations. The causes were two-fold. First, the ABI covered only the production sector at the time that WERS 1998 was being designed and put into the field, so that consent to link to the ABI was only sought from WERS establishments operating in the production sector. Second, that being a sample survey among enterprises with fewer than 250 employees, the ABI has only partial coverage of the population of private sector businesses. Consequently, only some of the workplaces providing consent in WERS 1998 could be identified on the ARD as having provided an ABI return for 1997. It was also the case for establishments belonging to multi-plant organisations that the unit

¹ Respondents are, however, asked to cite the basis for their assessment of financial performance (e.g. sales, profits, share price).

of observation in the ABI and WERS did not commonly correspond, as the ABI tends to be completed at enterprise level.

The problems evident in trying to link WERS 1998 and ABI performance data led the Performance/Technology Specialist Team and the WERS Research Team to consider how objective performance data might be better collected in WERS 2004. It was clear that the size of any WERS-ABI linked dataset could be extended considerably by a more wide-ranging consent question that included service industries and which also provided for linkages to be made to multiple years of data in the ARD. However, one would still expect only a subset of WERS workplaces to feature in the ARD and questions would still remain about the common mis-match in units of observation. Accordingly, it was also agreed that, subject to successful pre-testing, WERS would attempt to collect data at establishment level through the development of a new questionnaire focused specifically on financial performance. The development of the Financial Performance Questionnaire also arose out of an appreciation – subsequently supported by ONS research (Mills and Palmer, 2007) – that many organisations do hold data on the performance of individual establishments, although they may not always choose to supply such detailed information in response to the ABI. The results were: (i) a revised linking question (MLINKDAT) that provides for the data from consenting workplaces to be linked to other research databases, such as the Annual Respondents Database; and (ii) a four-page Financial Performance Questionnaire (FPQ) that was issued to all workplaces at the end of the Cross-Section Management interview.

Most of the questions that were included in the Financial Performance Questionnaire were based on those used in the short-form versions of the ABI. The main alteration was to shorten some of the very detailed ABI instructions about what should be included or excluded in the totals, recognising that an overly technical questionnaire may provoke non-response among potential respondents who were not specialised financial managers or accountants. Further departures from the ABI were to include questions on the numbers of full and part-time employees, the value of assets and the extent of research and development activity. Research economists and professional accountants were consulted over the range and wording of questions prior to piloting.

Outcomes:

FPQs were distributed in 2,076 of the 2,295 workplaces that participated in the Cross-Section Survey (Chaplin et al, 2005: 63).² Following a three-stage reminder process, FPQs were obtained for 1,070 of these workplaces, representing a response rate of 52 per cent among workplaces accepting placement of the questionnaire and a rate of 47 per cent among all Cross-Section workplaces (*ibid*). Respondents were encouraged to complete the questionnaire solely about the workplace that had been the subject of the Management interview, but were given the option to report on some larger observational unit, e.g. the whole enterprise, if this was not practical. In the event, some 834 of the 1,070 FPQs were completed with reference only to the WERS workplace.

The process of linking WERS to the ARD was also repeated. Consent to data linking was obtained from 2,166 (94 per cent) of the 2,195 workplaces in the WERS 2004 Cross-Section. Some 700 of these workplaces were found to have an ABI return covering a financial period that included the date of the WERS 2004 management interview (most of these returns deriving from the 2004 ABI). In 132 of these 700 cases, the ABI return covered only the workplace surveyed in WERS. There is the promise of longitudinal data once later years of the ABI are released: around four-fifths of matched workplaces have ABI returns for 2003 as well as 2004.

² Questionnaires were issued to workplaces in the private and public sectors. Public sector establishments were asked to report on the value of their overall budget, rather than levels of turnover.

Evaluation:

Forth and McNabb (2007a) provide an initial evaluation of the objective measures of productivity and profitability that may be obtained from the FPQ and ABI. They conclude that the values provided in the FPQ corresponded well to those provided in the official ABI inquiry when both returns were completed at site level. Both datasets may then serve as a source of objective site-level performance data. However, the values do not correspond well in cases where the ABI return is completed about a wider unit (e.g. the whole organisation). They thus conclude that the many enterprise-level returns in the ABI – and the few that appear in the FPQ – are not useful.

In a subsequent paper, Forth and McNabb (2007b) then go on to compare the objective measures of workplace performance with the subjective ratings also collected in WERS 2004. Their comparison is based on the compilation of a composite dataset of objective data, which draws site-level values from both the FPQ and ABI. Specifically, the ABI was used to provide additional information for some workplaces that did not complete the FPQ or where the ABI data coincided more closely with the Management interview date than the FPQ information for the same workplace. Overall, 597 of the 1,757 trading sector workplaces in the WERS 2004 Cross-Section Survey had site-level objective data on labour productivity that related to a time period within one year of the Management interview date; 526 trading sector workplaces had equivalent objective data on profitability.³ Around 70 per cent of the observations derived from the FPQ with the remainder derived from the ABI. The comparison between these objective values and the subjective assessments provided evidence of some congruence between the measures, with the objective and subjective measures of profitability being more closely aligned than the equivalent measures of productivity. However, in either respect the degree of correlation was rather weak. Forth and McNabb nevertheless found that both types of performance measures tended to produce similar results when used in structural models of the determinants of workplace performance, a finding which might provide some degree of support for past research based on the subjective evaluations.

They concluded that the objective and subjective measures each had their own advantages and disadvantages, and recommended that future research on workplace performance should give most weight to findings that can be replicated across both types of measure.

Further data from FAME:

In January 2008, ONS also established a link between the WERS 2004 Cross-Section data and the FAME database. FAME (Financial Analysis Made Easy) is a database that provides financial and descriptive information on companies in the UK and Ireland. The ONS have now made available links from the Inter-Departmental Business Register (IDBR) to company reference numbers (CRN) used within the 2004 FAME database at the Virtual Microdata Laboratory (VML). These CRNs are available for 1,266 establishments in WERS 2004, providing users with the mechanism to link WERS to FAME data for these workplaces. The linkage offers the opportunity to further augment the existing data on workplace performance. However, one limitation is that the link between CRNs and WERS workplaces is necessarily made at the level of the enterprise. It is not possible to attribute workplaces that belong to the same enterprise to individual companies within that enterprise and, in practice, only 568 of the 1,266 linkable workplaces can be mapped across to a single CRN; the remaining 698 map across to more than one CRN, by virtue of belonging to large and complex enterprises. These match rates do, however, vary by industry sector. Aumeyer (2008) provides further details.

³ The data provided two measures of labour productivity: turnover per worker and gross value-added per worker. Profitability was estimated in a rudimentary manner as gross value-added minus employment costs and capital expenditure, again divided by the number of workers.

A note on analytical methods:

A typical framework for industrial economists would be the Cobb-Douglas production function (<http://en.wikipedia.org/wiki/Cobb-Douglas>). This is typically estimated in logs via Ordinary Least Squares, with the natural log of value-added (GVA) as the dependent variable and the natural log of employment (L) and natural log of capital (K) being entered on the right-hand side of the equation (alongside other variables). An alternative is to use $\ln(\text{GVA}/L)$ as the dependent variable and to add $\ln(K/L)$ on the right hand side. One would typically expect coefficients approximating 0.7 on $\ln(L)$ and 0.3 on $\ln(K)$, or alternatively 0.3 on $\ln(K/L)$, reflecting their relative contributions to output in the national accounts (since the coefficients correspond to the output elasticities). One would also expect the two coefficients to sum to one (under the assumption of constant returns to scale). But it is common to see lower coefficients than these, particularly in plant level data, which is generally attributed to measurement error (particularly on capital stocks). The exploratory analysis presented in Kersley et al (2006: 354, endnote 24) suffered from this problem, to the extent that the capital-labour ratio was not significantly different from zero in some sub-samples (implying that output/head cannot be raised by substituting capital for labour, which is implausible).

It should be noted that, unlike the FPQ, the ABI data do not contain measures of the numbers of full-time equivalents or of the value of capital stocks. However, ONS have compiled estimates of capital stocks for some plants from historic data on capital investments and these data are available in the ONS Virtual Microdata Laboratory.

2. Employee representatives

The WERS series has always included a survey of employee representatives. However, in the early part of the series, the survey had a particular focus. Reflecting the prevailing interests of policy makers and academics at the time, the first three surveys in the series (conducted in 1980, 1984 and 1990) focused solely on union representatives (specifically, the senior reps of the manual and non-manual bargaining units that covered the largest numbers of employees at the establishment). The questionnaire was then used to investigate their role in the workplace, and also to collect a second viewpoint on some of the issues that had been covered in the management interview (e.g. the availability of disputes procedures, the incidence of industrial action).

The exclusive focus on union reps was increasingly seen to have limitations, given the shrinkage of the union sector in the late 1980s and early 1990s, and so the 1998 survey adopted a different approach, seeking to also collect data from non-union employee representatives. Specifically, the survey targeted the senior non-union employee representative on the workplace's most wide-ranging joint consultative committee. The 1998 survey also changed its approach to union reps, shifting away from the focus on bargaining units and restricting the survey to one union rep interview by opting to interview the senior representative of the recognised trade union that accounted for the largest number of members at the workplace. However, the survey opted to interview only one employee representative in workplaces where union and non-union reps were both present, and the selection rule gave precedence to union reps in these instances. Accordingly, the 1998 survey collected some interesting data from non-union reps, but the sample was not representative and the data were seldom used.

With the European Union's Information and Consultation Directive due to be transposed into UK law in 2004, it was felt that the 2004 WERS needed to provide a richer and more robust set of data on the incidence, characteristics, roles and activities of employee representatives – both union and non-union. It was also felt important to collect data from employees about their perceptions of the role of employee representatives as a source of information about the workplace, and to collect data on employee's perceptions of the relative strengths of union and non-union reps.

This led to four related changes to the survey instruments. Revisions were made to the following:

1. The questions in the Management Questionnaire on the presence of different types of employee representative at the establishment
2. The selection rule for the Survey of Worker Representatives
3. The whole of the Worker Representative Questionnaire (re-titled as the Employee Representative Questionnaire)
4. The questions on employee representatives in the Survey of Employees

The introduction of new questions on trust between managers and employee representatives are also relevant (see Guest et al, 2007, for a discussion).

Revisions to Management Questionnaire:

The Management Questionnaires of 1990 and 1998 both included questions to identify the presence and incidence of reps of recognised trade unions. They also both included questions to identify the presence and incidence of non-union reps. However, the 1990 questions on non-union reps (C41 and C42) did not identify the institutional position of non-union reps (in particular, whether they sat on a joint consultative committee or otherwise acted as stand-alone reps). The 1998 questions (EOTHREPS-ESITON) went some way to addressing this issue by asking whether the reps sat on the main joint consultative committee at the workplace, but the wording of the introductory

question (EOTHREPS) did not use the term 'non-union' and so it was possible that representatives of non-recognised unions may have been included by respondents.

The equivalent set questions for WERS 2004 were therefore revised so that one could separately identify both the presence and incidence of each of the following four types of employee representative:

1. Reprs of recognised trade unions (ESTEWARD, ESTEWNUM)
2. Reprs of non-recognised unions (EOTHUREP, ENUMOTHU)
3. Non-union reprs sitting on a joint consultative committee (EOTHREPS, ENUMREPS, ESITON and ESITNUM - if ESITON=Yes)
4. Non-union reprs not sitting on a joint consultative committee, i.e. performing a stand-alone role (EOTHREPS, ENUMREPS, ESITON and ESITNUM - if ESITON=No or (ESITON=Yes but ESITON<DREPNUM))

This suite of questions allowed analysts to arrive at estimates of the proportions of workplaces with each type of representative (see Kersley et al, 2006: 108-143), and also allowed for estimates to be produced of the total numbers of each type of representative (see Department of Trade and Industry, 2007: 77).

Further revisions to the Management Questionnaire saw the introduction of questions on the presence of union learning representatives (EULR, EULRNUM), and the introduction of questions on whether on-site lay union representatives occupied seats on a workplace joint consultative committee (EUJCC and EUJCCNUM).

Revised selection rule for Survey of Worker Representatives:

The revisions to the Management Questionnaire allowed WERS to adopt a new selection rule for the Survey of Worker Representatives. This new selection rule gave equal selection rights to union and non-union representatives, thereby doing away with the preferential treatment given to union reprs in earlier surveys in the series. The selection rule did, however, give preference to certain types of union and non-union rep. The rule was as follows:

For union reprs:

1. If any unions with members at the workplace are recognised (ETOTREC>0) and the recognised union with the largest number of members at the workplace (EMOSTMEM) has a lay representative covering the workplace (ESTEWARD=1 or ESTEWEXT=1): interview sought with the senior lay representative of this union
2. If no unions with members at the workplace are recognised but there are non-recognised unions with members at the workplace (ETOREC=0 and EUNIONUM>0), and at least one of these non-recognised unions has a lay representative at the workplace (EOTHUREP=1): interview sought with the senior lay representative of the largest non-recognised union

For non-union reprs:

1. If the workplace had at least one non-union representative (EOTHREPS=1) and one of these non-union representatives sat on the workplace joint consultative committee that dealt with the widest range of issues (ESITON=1): interview sought with the senior non-union representative sitting on this joint consultative committee.

2. If the workplace had at least one non-union representative (EOTHREPS=1) but none of the non-union representatives sat on the workplace joint consultative committee that dealt with the widest range of issues (ESITON=2 or -1): interview sought with (what was thus termed) the senior 'stand-alone' non-union representative.

The selection rule thereby provided the framework to obtain representative samples of 'type 1' reps in either case. The samples of 'type 2' reps could clearly not provide representative samples of those types of reps, since type 2 reps only had a chance of selection when type 1 reps were absent. However, in the case of union reps, the selection rule did provide a framework to obtain a more or less representative sample of senior reps from the largest union (irrespective of recognition status), since the largest union in an establishment is usually recognised, or rather other unions are unlikely to be recognised if the largest is not.

A total of 1,285 eligible representatives were identified at 1,120 establishments. The variable NERQREQ on the deposited dataset relating to the Cross-Section Management interview identifies a workplace's eligibility for a Worker Representative interview of each specific type, whilst the variable NERQRESP indicates the types of Worker Representative interview that were eventually achieved. The variable WAREPTYP on the deposited dataset relating to the Cross-Section Worker Representative interview classifies interviewed reps to each of the four types. The Worker Representative survey obtained the following numbers of interviews:

Rep of largest recognised union	700
Rep of largest non-recognised union	35
Non-union rep on JCC	181
Stand-alone non-union rep	68
TOTAL	984

A total of 895 workplaces provided interviews with employee representatives. In 89 workplaces, interviews were obtained with one union and one non-union representative, thereby enabling the experiences of the two types of rep to be directly compared.

The revision of the selection rule means that it is not possible to compile consistently-defined samples of non-union reps from the 1998 and 2004 Surveys of Worker Representatives. However, it is possible to compile consistently-defined samples of union reps from 1998 and 2004 (Kersley et al, 2006: 144-177 present a small number of comparisons). Unfortunately, comparisons with earlier years are difficult. In the 1984 and 1990 surveys it is not possible to identify whether interviewed reps necessarily belong to the largest recognised union at the establishment. In the 1980 survey, this is possible, but the number of questions that retain the same wording in the 1998/2004 Worker Representative questionnaire is very small.

Revised Questionnaire for Worker Representatives:

It was noted earlier that one of the functions of the Worker Representative interview in the 1980-1998 surveys was to collect a second viewpoint on some of the issues that had been covered in the management interview. Whilst this repetition of certain questions in both the Management and Worker Representative questionnaires did yield some interesting insights – helping analysts to obtain a better estimate of the true incidence of industrial action for example (Daniel and Millward, 1983: 215-217) and providing an insight into the character of the workplace when managers and reps were not found to agree (Peccei and Benkoff, 2001) – very few users of the WERS datasets took advantage of the availability of such dual data. Moreover, it was apparent that some important topics had hitherto been excluded from the Worker Representative interview (e.g. union reps' efforts to recruit new members). And the greater prominence given to the selection of non-union

reps meant that it was appropriate to include additional questions about the role of non-union reps, and also about the interaction between union and non-union reps in so-called 'dual channel' workplaces where both were present. Consequently, the Worker Representative Questionnaire experienced some substantial revisions. The revisions did not lead to the wholesale removal of all questions that had duplicates in the Management Questionnaire. Some of these questions were retained, especially those asking about the extent of harmony or discord in the workplace, where one might expect managers and worker representatives to have different points of view. But on issues of more objective fact (e.g. the existence of certain institutional arrangements or procedures), such duplication was generally removed as it was felt that the interview time could be better used (see Charlwood et al, 2007: 77-80 for further details).

The structure of the 2004 Worker Representative Questionnaire was as follows:

- A Background information
- B Structure of representation at workplace: union representatives
- C Structure of representation at the workplace: non-union representatives
- D Negotiation, consultation and information provision
- E Role of employee representatives
- F Collective disputes
- G Redundancies, grievance and disciplinary procedures
- H Employee representative - management relations
- I Contact with external organisations
- J Union recruitment
- K Workplace change
- L Personal characteristics

New questions in Survey of Employees Questionnaire:

The final set of revisions relating to the issue of employee representation took place in the Survey of Employees. The 1998 Survey of Employee Questionnaire had included questions that asked employees to evaluate the effectiveness of different mechanisms for information provision (B6) and to evaluate their managers' ability to inform and consult employees (B8). The context provided by the EU Information and Consultation Directive meant that these questions were retained, but they were revised such that 'employee representatives' were added as another option on B6 (which became B7 in the 2004 questionnaire) and B8 was recast to focus more directly on managers' engagement with employees in decision-making. Those items on the 1998 B8 which had covered managers' ability to 'keep everyone up to date about proposed changes' and to 'deal with work problems you or others may have' were dropped, whilst a further item on managers' ability to 'treat employees fairly' was moved to C2 with a revised response scale.

In order to acknowledge more directly the role that non-union representatives play in some workplaces, non-union reps were added as an explicit option on the question which asked employees to evaluate the effectiveness of different mechanisms for improving their own terms and conditions (1998 C2, moved to D2 in 2004).

The final revision to the 2004 questionnaire was to omit 1998 C3: a question which asked about the frequency of employees' contact with worker representatives. This had been little used in either the primary or secondary analysis of the 1998 survey data.

3. Competitive strategies

The surveys in the WERS series have always included questions on the nature of the product market in which the surveyed establishment operates, enabling analysts to gauge the nature and intensity of competition faced by the workplace. However, WERS has rarely included any questions on the nature of the competitive strategy that the workplace has adopted in pursuit of competitive success in their product market, i.e. whether the establishment seeks to compete on price, quality or other issues such as product innovation. The exception was the 1990 WIRS, in which the questionnaire for financial managers (used in cases where the main management respondent was a personnel specialist) included a question that asked the financial manager to name the two features of their establishment's main product or service that were most crucial for competitive success (question: F-A30, F-A53 or F-A76 depending upon routing). The possible responses were: price; quality; responsiveness to customer requirements; marketing/advertising; providing a distinct product or service; delivery time/availability; and 'other (please specify)'. However, the data was of limited value because the workplaces in which interviews took place with financial managers were necessarily a non-random subset.

This question was not repeated in WERS 1998. The only related item in the 1998 management interview was a question (KESTPER3) which asked the manager to rate the quality of their main product or service in comparison with other establishments in the same industry (responses were invited on a five-point scale from 'a lot better than average' to 'a lot below average'). However, the absence of questions on other dimensions of the establishment's competitive strategy – most notably their reliance on price – meant that the data provided only a partial indication of the overall strategy.

During the development of WERS 2004, it was thought necessary to return to this issue of competitive strategy and to develop a set of questions that could be added to the 2004 management interview. The reasons were two-fold. In the first instance, it was recognised that there is likely to be a direct link between the workplace's competitive strategy and the way in which it practices employment relations. For example, an establishment that competes heavily on price is likely to be particularly concerned about labour costs and so may seek to pay wages that are lower than those paid by establishments that are less price-focused. Conversely, an establishment that competes heavily on product quality or innovation is likely to invest more heavily in skilled workers and in workforce training. And so the inclusion of questions on competitive strategy would improve the analyst's ability to understand variations in employment relations practice between establishments: particularly those within the same industry. In the second instance, it was recognised that the 'contingency theory' of HR effectiveness proposes that certain configurations of HR practices will have their most beneficial impact on establishment performance when aligned with a complementary competitive strategy. And so it was recognised that the collection of data on an establishment's competitive strategy could prove useful when seeking to understand variations in the impact of HR practices on workplace performance: an issue that was particularly important in view of the plans to collect objective performance data.

Devising questions for the Management interview

An establishment's competitive strategy might be said to comprise three components: the specification of the product / service; the nature of the product / service's production; and the way in which the product / service is taken to market (what Michael Porter calls the competitive advantage). Each of these three components may be further unpacked, as follows.

The product specification comprises:

- the number and sophistication of embodied characteristics – 'complexity'
- the degree of change in those characteristics over time – 'specification change'
- the extent to which the specification is (or can be) tailored to the tastes of particular customers – 'customisation'
- the extent to which the specification is based upon those already in existence – 'innovation'

The nature of production incorporates:

- the methods used in production or service delivery (degree of automation; skills requirements; work organisation)
- the volume of production or service delivery
- the extent to which the product or service is delivered to specification

The way in which the product will be taken to market comprises:

- the cost (high or low price)
- the extent and nature of any differentiation (same product as others or unique; and if unique, how: whether some aspect of the product specification or some aspect of the delivery, such as speed or availability).

Each of these three components, and their various sub-components, might be hypothesised to have some potential relationship with the practice of employment relations at an establishment. For example, as noted above, an emphasis on low cost (market price) can be expected to necessitate downward pressure on wages. And so the Research Team considered how these various aspects of an establishment's competitive strategy might be incorporated within the questionnaire.

Some were already covered to an extent. Skill requirements and work organisation were already covered in Section C of the questionnaire, whilst volumes could be expected to be proxied by the number of employees at the establishment, all other things being equal. Delivery to specification might be indicated by error rates or similar. These data are necessarily industry-specific, but KWRKPLAC, which asks whether the workplace has attained the BS5750 or ISO9000 quality standards, could be expected to provide some indication of the quality of production processes.

New questions were therefore sought to capture the remaining items. A review of existing surveys identified relevant questions in the 1996 survey of Employee Direct Participation in Organisational Change (EPOC), a 10-country survey co-ordinated by the European Foundation for the Improvement of Living and Working Conditions, and in the 2002 Employer Perspectives Survey (EPS), a follow-up to the 2001 Skills Survey co-ordinated by the ESRC-funded SKOPE network.

The EPOC survey asked the manager to rate the importance of four items to their company's competitive success: price, quality, variety and service. Each question used a three-point scale (not important to very important). The EPS survey included four questions which asked the manager to rate their main product or service on each of the following dimensions: complexity; customisation; price sensitivity; and volume of production. The complexity question used a four-point scale (much less complex to much more complex than the industry average). The remaining questions used a five-point scale (strongly agree that this is a feature to strongly disagree).

Accordingly, it was apparent that neither of these existing surveys covered all of the items identified by the research team. And so the set of questions adopted for WERS 2004 would need to be original, at least to some degree.

Final questions and preliminary analysis

There was insufficient space in the questionnaire to permit a single question to be asked on each of the items identified by the research team, and so a compromise was adopted. This involved the use of the scaled-response approach evident in EPOC and EPS, but only for two items that were thought to be particularly relevant to employment relations: price (KPRICE) and the broadly-defined issue of quality (KQUAL). Five-point scales were used for each, ranging from 'demand not at all dependent on...' to 'demand heavily dependent on...'. A further question (KRANK) then adopted the approach taken in WIRS90, asking the respondent to choose the two factors, aside from price and quality, that were most important to their competitive success. This response list for this question was intended to cover the remaining components of competitive strategy outlined above.

Response rates to all three questions were high (at least 97 per cent). However, it was apparent that, whilst establishments were spread out along the five-point response scale on KPRICE, there was more bunching on KQUAL, with few establishments reporting that demand was relatively insensitive to quality. This has also been found in other surveys. Cross-tabulation of the final results on KPRICE and KQUALITY indicates that there are two principal categories of establishment: those who emphasise quality but not price; and those who emphasise both quality and price.

Cell percentages

		To what extent would you say that the demand for your (main) product or service depends upon you offering better quality than your competitors?					
		1 Demand does not depend at all on quality	2	3	4	5 Demand depends heavily on superior quality	All workplaces
To what extent would you say that the demand for your (main) product or service depends upon offering lower prices than your competitors?	1 Demand does not depend at all on price	3	1	1	2	9	16
	2	0	1	1	5	6	13
	3	0	1	5	12	12	29
	4	0	1	5	11	6	22
	5 Demand depends heavily on offering lower prices	2	0	5	3	10	19
All workplaces		5	3	17	32	42	100

Responses on KRANK indicated that, among the remaining factors, offering a high level of customer service was the most common means of seeking competitive advantage, followed by customisation.

Cell percentages

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KRANK	1 Offering a complex product or highly-skilled service	21
	2 Offering a product or service with unique features	22
	3 Developing new products or services	10
	4 Customising to meet the needs of particular customers	44
	5 Maximising availability or minimising delivery times	19
	6 Offering a high level of customer service	67
	7 Other (please specify)	3
	95 Other specific answer	0
	96 Vague/irrelevant answer	1
	All workplaces	100

Primary analysis supported at least some of the hypotheses that lay behind the inclusion of questions on competitive strategy in the survey, finding that the nature of an establishment's competitive strategy was related to the extent of its provision of off-the-job training for example (Kersley et al, 2006: 84).

4. Computer use

The issue of micro-technology was the subject of questioning in the early surveys in the WERS series (especially WIRS 1984 – see Daniel 1987). However, the coverage of the topic was reduced in the 1998 survey, so that only a single question remained, asking workplace managers whether the workplace had introduced any new technology in the five years preceding the survey. One reason for the diminution in the range of questioning was the perceived difficulty of framing questions about technology use at a time when the nature of specific applications was changing at a particularly rapid rate. Another was pressure on the overall length of the questionnaire. However, the interest in the role of technology in workplace dynamics remained and calls were made for an expansion in the range of questions in this area in the 2004 survey. This led to three related developments:

1. the insertion of a question on the overall extent of computer use at the workplace (Management Questionnaire: CCOMPUT)
2. the refinement of questions on the introduction of new technology (Management Questionnaire: LMANCHA)
3. the insertion of a question on computer use by individual employees (Survey of Employees: E9).

Management Questionnaire: CCOMPUT and LMANCHA

The question added to the Management Questionnaire (CCOMPUT) asks simply for “the proportion of all employees who use computers as part of their normal work duties”. Interviewers were guided to exclude employees who used electronic cash registers and to exclude employees who worked on computer-controlled machinery, unless the employee interacted with the computer that controlled the device. Respondents were asked to give an answer to the nearest 10 percentage points. In practice, the responses given were not always rounded in this way.

More detailed questions on the types of uses to which computers are put were rejected as potentially being difficult for a respondent to answer accurately, particularly in a large workplace. Instead, it was considered that the SEQ was the better place to collect more detailed information on types of computer use. Detailed questions on other types of technology were also rejected because of the difficulty of framing questions that were valid across many different industrial sectors. A general focus on 'computer-controlled machinery and equipment' was also thought likely to raise questions during the interview about what should be included under this heading.

The set of questions on workplace change in Section L of the questionnaire (LMANCHA, LIMPCHA) was also amended to separately identify workplaces which had introduced or upgraded computers from those which had introduced or upgraded other forms of new technology. The recall period was shortened from five to two years, in keeping with most other retrospective questions in the Management Questionnaire, because of concerns from the fieldwork company that questions with recall periods beyond two years in length were unlikely to collect reliable answers.

Finally, it is noted that the Management Questionnaire also includes a question to identify workplaces in which experienced members of the largest occupational group have received off-the-job training in computing skills in the year preceding the survey (CHOW).

Survey of Employees: E9

A new question was added to the 2004 WERS Survey of Employees which focused on the types of tasks for which employees use computers (question E9). The list of responses included 11 specific tasks (including word processing, entering data and controlling machinery), along with a generic category (“Any other task”) and a category for employees who did not use computers as part of their work.

The list of specific tasks was compiled after a review of similar questions that had already been used elsewhere. These included Question 22(c) in the employee questionnaire for the Canadian 2004 Workplace and Employee Survey (<http://tinyurl.com/3d58ff>) and Questions 2-7 in a US Bureau of Labor Statistics survey on Computer Use and Internet Use at Work (<http://tinyurl.com/3da8vq>).

Whilst the WERS list built on these surveys, revisions were made both to separate out tasks that had been grouped in other surveys (e.g. word processing and desk-top publishing were a combined item in the BLS survey, but separated in WERS) and to retain a focus on tasks rather than specific types of software application (e.g. avoiding codes for the use of spreadsheets or databases, and instead focusing on the uses to which such programs might be put, e.g. checking stock levels).

The resulting data have been used by Dolton and Pelkonen (2007) and Dolton et al (2007) to assess the impact of different forms of computer use on earnings.

5. Wages

WERS 2004 contains three sets of questions on wage levels. Question E15 in the Survey of Employees asks all employees to categorise themselves into one of 14 bands of gross weekly earnings. Question E16 asks them to do the same with four bands of gross hourly earnings. Question 9 on the Employee Profile Questionnaire asks the management respondent to categorise all employees aged 22 and over into the same four bands of gross hourly earnings.

Taking these three sets of questions in turn:

Survey of Employees, Question E15:

Wages are a key variable of interest in the study of employment relations. They are the most significant reward that employees receive from their work, and also typically account for a substantial share of employers' costs. There are, however, a number of practical difficulties in collecting accurate wage data in voluntary surveys. Employees typically find it difficult to report their wages accurately without referring to their wage slip. Employees may also skip over questions on wages because of concerns about confidentiality. Both issues impact most in self-completion questionnaires such as the WERS Survey of Employees, because there is no mechanism for ensuring that employees check their wage slips and there is no means of providing additional reassurance to the respondent; both are at least possible in a face-to-face or telephone interview.

In view of these practical difficulties, WERS 1998 and WERS 2004 both opted to ask employees to categorise their gross weekly wages into one of a number of bands or intervals. This approach serves to minimise respondents' concerns about confidentiality and also encourages high response rates since employees are not required to recall their precise wage in pounds and pence. The question was introduced in 1998, when 12 bands were used. These bands were narrower at the bottom of the wage distribution and wider at the top, with the aim of capturing broadly similar proportions of employees in each of the 12 bands. The WERS98 question attracted a response rate of 99 per cent and the resulting data compared well with the distribution of gross weekly earnings obtained in the Spring 1998 Labour Force Survey (see Forth and Millward, 2002: 549-550).

Further analysis of the 1998 data suggested that it may be beneficial to have greater detail at the top and bottom of the distribution.⁴ Accordingly, in 2004, one of the wider bands at the bottom end of the wage distribution (£81-£140 per week) was split into two equal parts. The previous upper band of £681 or more per week was also capped at £870 per week and a new upper band of £871 or more was added. The question obtained a response rate of 98 per cent and the distribution of wages was similar to that obtained in WERS 1998, albeit that it had shifted to the right as one might expect after six years of wage inflation.

Despite the low levels of non-response, the banded nature of the data seemingly presents some problems for the analyst who may be used to employing Ordinary Least Squares with continuous wage data. Some analysts have attempted to deal with this problem by compiling a continuous measure of wages which approximates each employee's wage as the mid-point of their hourly wage interval.⁵ However, the process of assigning mid-points to the open-ended intervals at the top and bottom of the distribution is necessarily ad hoc. Furthermore, Mark Stewart (1983) has shown that such methods do not generally result in consistent estimates. Stewart instead developed a limited dependent variable procedure termed 'interval regression' for use with banded earnings data (*ibid.*).

⁴ The WERS 2004 Research Team are grateful to Nikos Theodoropoulos for this suggestion.

⁵ The upper and lower bounds of the hourly wage interval can be computed by using the wage thresholds for a particular band on E16 in combination with the weekly hours, recorded in A3.

The routine is available in Stata (command name: `intreg`). For an application using the data from the WERS Survey of Employees see, for example, Forth and Millward (2002).

It is noted that some analysts still revert to the use of mid-points when attempting to analyse the variance in wages within and across workplaces, as there does not appear to be a readily-available procedure for implementing this multi-level analytical approach with banded data.

Survey of Employees, Question E16:

One of the limitations of E15, as discussed above, is that it does not provide a readily-available indicator of an employee's hourly earnings. Whilst it is possible to identify the range within which an employee's hourly wage lies (e.g. £5.10-£8.00 per hour for an employee selecting the second box at E15 and working 10 hours per week), this range may differ slightly for the next employee (e.g. if they worked 11 hours per week), and so on. As a consequence, there are no clear break points that can be used to categorise employees cleanly into bands of hourly earnings using the data provided in E15 and A3. This inhibits any analysis which might attempt to compare the characteristics of low and high-paid workers. Question E16 was introduced to address this issue. In view of the reservations (stated above) about a question that asked employees to report their actual wage, employees were asked to categorise themselves into four bands of gross hourly earnings:

- £4.50 or less per hour
- £4.51 - £5.00 per hour
- £5.01 - £14.99 per hour
- £15.00 or more per hour

The figure of £4.50 was chosen as the upper limit of the first band because the adult rate of the National Minimum Wage (NMW) stood at £4.50 at the beginning of survey fieldwork in February 2004. The upper limit was purposefully not set at £4.49 as it was felt that this could be seen by employers as an explicit attempt to identify non-compliance with the NMW and thus put their co-operation with the survey at risk.⁶

The figure of £5.00 was chosen as the upper limit of the second band because, at the time of designing the survey, it was felt that the NMW adult rate had a reasonable chance of moving from £4.50 to £5.00 at its next uprating.⁷

The figure of £15.00 was chosen as the lower limit of the fourth and final band because, at the time of designing the survey, analysis of wage data in the Quarterly Labour Force Survey showed that similar proportions of employees were earning £15.00 per hour or more as were earning £5.00 per hour or less; the £5.00 and £15.00 cut points would therefore identify similarly sized samples of higher and lower-paid employees. This is borne out in the WESR 2004 data.

Employee Profile Questionnaire, Question 9:

The bands of gross hourly wages used for Question E16 in the Survey of Employees Questionnaire were also adopted in Question 9 on the Employee Profile Questionnaire. This question replaced a similar question in WERS 1998 which had asked the management respondent to categorise their

⁶ Some employers ask to see the Survey of Employees Questionnaire before they will allow it to be distributed among employees at their workplace.

⁷ In fact, the adult rate of the National Minimum Wage rose to £4.85 on 1st October 2004, at which point 67 per cent of management interviews had been completed (Chaplin et al, 2005: 25). The adult rate rose again to £5.05 on 1st October 2005.

employees into six bands on the basis of gross annual wages. It was felt that a categorisation based on annual wages was of limited value, given the obvious variation in employees' hours of work. Indeed, it appeared that the data collected in WERS98 had been little used by analysts (although see Belfield and Heywood, 2001). Accordingly, a categorisation based on hourly wages was adopted, albeit one that employed only four bands.

The 2004 question varied from its predecessor of 1998 in another respect, since the manager was asked to report only on employees aged 22 or over. This age restriction was introduced in order to align the data with the age range used for the adult rate of the NMW. The questionnaire did not include a second question on the wages of younger employees for reasons of questionnaire length and survey burden. In practice, it appears that a number of employers ignored the age restriction noted in the question wording and instead reported on their whole workforce at EPQ Question 9 (see Kersley et al, 2006: 349, endnote 16).

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