

CENTRE FOR ECONOMIC PERFORMANCE

DISCUSSION PAPER NO.145

May 1993

USES OF THE WORKPLACE INDUSTRIAL RELATIONS
SURVEYS BY BRITISH LABOUR ECONOMISTS

N. MILLWARD

ABSTRACT

The huge growth of nationally representative survey datasets based upon individuals and households has not been matched in most industrialised countries by a similar development of establishment or enterprise based surveys. In Britain the imbalance has been partially redressed by the Workplace Industrial Relations Survey series, started in 1980. A few other countries have initiated similar developments. The British series is now a core resource for institutional labour economists and has generated a substantial literature. This paper discusses some of the specifically economic data gathered in the surveys and some of their uses.

This paper was produced as part of the Centre's
Programme on Industrial Relations

USES OF THE WORKPLACE INDUSTRIAL RELATIONS SURVEYS
BY BRITISH LABOUR ECONOMISTS

Neil Millward

	Page
Introduction	1
The design of the survey series	2
Secondary analysis of WIRS	9
Enhancement of the economic context and performance measures in the 1990 survey	23
Conclusions	28
Endnotes	29
References	31

This paper was originally an invited paper, presented at the United States Bureau of the Census Annual Research Conference in Washington, DC, in March 1993 under the title, "How British Labor Economists Benefit from Establishment Surveys".

USES OF THE WORKPLACE INDUSTRIAL RELATIONS SURVEYS BY BRITISH LABOUR ECONOMISTS

Neil Millward¹

Introduction

"The contrast between data available on the supply side of the labor market and the demand side is striking. No national probability samples exist for industrialized countries at the establishment level which can be used to characterize the microeconomic choice processes of firms in a fashion analogous to the way in which the choice processes of households and individuals can be characterized." Handbook of Labor Economics (Stafford 1986)

It is, indeed, rare for labour economists to have access to nationally representative survey data on the demand side of the labour market. Surveys of employers are so expensive, especially when they involve face-to-face interviews, that they can rarely be mounted to address a single set of research issues.

The British Workplace Industrial Relations Surveys (WIRS) of 1980, 1984 and 1990 are a series of national probability samples at the establishment level. They fit most of Stafford's requirements. While initially concerned with describing and monitoring institutional labour relations practices, they have, since the first survey, increasingly responded to the interests of British labour economists and now provide the empirical foundation for much research in the field. This paper discusses the WIRS series as a vehicle for addressing issues in labour economics, some of the practicalities of framing questions that economists

want asked and some of the econometric findings that the surveys have generated.

The design of the survey series

The Workplace Industrial Relations Survey (WIRS) series was developed at the end of the 1970s to remedy a widely acknowledged lack of systematic information about the structures and practices of labour relations in Britain. The series is the result of continuing collaboration between the *Department of Employment*, the *Economic and Social Research Council*, which is the main provider of state funds for scholarly social research, the *Policy Studies Institute*, an independent research institute, and the *Advisory Conciliation and Arbitration Service*, the state-sponsored bi-partite body responsible for improving industrial relations. The reports from the 1980 and 1984 surveys (Daniel and Millward 1983; Millward and Stevens 1986; Daniel 1987) have been widely used in policy discussions and academic debate, as well as becoming standard references for teaching purposes. The report on the 1990 survey (Millward et al. 1992) was published last September and shows every sign of being equally well received. Indeed, the complete June 1993 issue of the *British Journal of Industrial Relations* is to be devoted to assessing changes in industrial relations over the past 25 years by reviewing the evidence from the WIRS series. Readers wishing to know how the aims of the surveys have developed in the light of changing research interests and the shifting policy context will find relevant material in the Preface, Introduction and Technical Appendix of each of the four above-mentioned books.

Sample design

In the WIRS series the workplace (or establishment) is the unit of observation and analysis because the substantive focus is on the actual practices of management-employee relations²

Most of the survey questioning is about matters that occur at the workplace and so respondents are, where possible, people who are employed there. The design specifies three primary respondents: the senior manager at the establishment who deals with industrial or employee relations; and, where present, the senior representative (or shop steward) of the largest manual and of the largest non-manual negotiating group or individual trade union. Secondary respondents were (in 1984) production or 'works' managers in larger manufacturing plants and (in 1990) financial managers in industry and commerce where the primary management respondent was a personnel specialist. These role-holders were selected as being in general the best-informed employees at the establishment about the substantive concerns of the survey.

The sample coverage was intended to be as comprehensive as possible, including all sectors of industry, commerce and the public services. In practice only agriculture, forestry, fishing, coal-mining and the armed forces were excluded. The other exclusion was very small workplaces, because they were likely to lack the formal institutions and practices that were the concern of the survey. A minimum size of 25 employees has been maintained throughout the series. This excludes about 90 per cent of workplaces and 30 per cent of employees from the scope of the surveys.

On each occasion the sampling frame has been the most recent Census of Employment, a comprehensive listing of employing establishments which is compiled from taxation registers. The samples are not clustered geographically, although the outlying islands of Scotland are excluded. They are stratified by size (number of employees), industry, region and type of employee. To facilitate comparisons between large and small establishments, and to increase the accuracy of estimates of employees covered by particular practices or arrangements, large establishments are oversampled. The datasets contain appropriate weights to make the sample representative of the population from which it was drawn. The sampling fractions used in the 1990 survey varied from one in 90 for the smallest establishments (25 to 49 employees) to one in 1.8 for the largest (1000 or more employees). Overall, the 1990 sample selected 3009 census units from the population of 142,283 units with 25 or more employees, a sampling fraction of one in 47.

Response to the surveys has always been good, with the response rate increasing from 75 per cent in 1980 to 83 per cent in 1990. In each survey the achieved sample has been just over 2000 establishments, involving around 4500 face-to-face interviews. Those with the main management respondents took about 90 minutes on average, using a complex schedule of questions ranging from 66 to 82 pages. Those with employee representatives lasted about 50 minutes using a much shorter schedule. Fieldwork and data processing for all the surveys have been carried out by Social and Community Planning Research, an independent, non-profit-making research organisation. Interviewers have received substantial training for the surveys and this, together with the use of

same research organisation throughout the series, has resulted in datasets of high consistency and quality.

A new feature of the project in 1990 was the inclusion of a separate and additional 'panel' sample, drawn from those establishments where interviews were successfully carried out in 1984³. A similar feature had been tried out in 1984 on a small scale and was felt to have been generally successful in practical terms; but the small size of the dataset meant that it had been little used. The 1984-1990 panel sample was considerably larger and it was concentrated upon industrial and commercial establishments, the 'trading sector', because it was here that most of the interest among potential analysts of the data was focused. The target sample size was 375 to 400 cases. As with the main sample, this was exceeded, mostly because of a higher than anticipated response rate. The number of productive cases was 537; the response rate was 87 per cent. Interviews with worker representatives were excluded from the panel interview requirements in 1990, but in almost all other respects the panel cases were treated in exactly the same way as cases in the main sample. The panel data have already proved invaluable in illuminating changes between 1984 and 1990. Moreover, they have unrivalled potential for causal modelling.

Content of the questionnaires

The questionnaires contain a large number of questions about employee relations at the workplace, mostly of a 'factual' nature (Smart and Stevens 1992). Generally the questions are focussed on the whole workforce or on discrete sections of it that have different arrangements on the topic in question;

sometimes the questioning is repeated for a number of occupational groups. There are many background and contextual questions about the establishment itself and the organisation to which it belongs. The series contains a core of substantive and background questions which have been asked on each occasion; around two thirds of the questions asked in 1990 were of this type.

The core substantive topics are: the role of managers responsible for employee relations; trade union membership; recognition of unions by management for representation and negotiating purposes; the coverage of collective bargaining; the structures, processes and outcomes of pay determination; union representatives, their local organisation and contacts with national officials; formal procedures for resolving disputes; the extent of disputes and industrial action; recruitment, dismissals and redundancy; the use of peripheral workers; payment systems and job evaluation.

Other questions included a special section on the introduction of new technology in the 1984 survey, the subject of a separate report (Daniel 1987), and a range of questions in the 1990 survey which concern the adoption of some of the newer practices used by employers (Daniel and Millward 1993).

Follow-up research

The surveys have also been extended by the use of follow-up interviews on related topics, thus capitalizing on the substantial costs involved in gaining access to a high quality, representative sample of employing units⁴. Each of the three surveys has had one or two follow-up studies. After the 1980 survey about 100 establishments with job evaluation schemes were the focus of a detailed

study of job evaluation and pay equity (Ghobadian and White 1988). A large-scale interview survey was conducted as a follow-up to the 1984 WIRS, investigating employers' labour use strategies (Wood and Smith 1989). There was also some follow-up case-study research on workers' support for technical innovation (Daniel and Hogarth 1991). The 1990 survey has incorporated an almost complete follow-up interview survey on training and employers' skills requirements, funded by the Employment Department and entitled the Employers' Manpower and Skills Practices Survey. In each case the follow-up research has depended on the management respondents' willingness to be approached for further information, as ascertained by a question at the end of the WIRS interview. Positive responses to this question have been around 95 per cent throughout the series.

Similar surveys in other countries

A very similar survey to WIRS was conducted in Australia in 1990 (Callus et al. 1991) and comparative work analysing it and the 1990 WIRS is beginning to emerge (Whitfield, Marginson and Brown 1992). Fieldwork for a similar survey in France began in April this year. There are also plans for a survey of comparable design in the Republic of Ireland. A survey with some resemblances to WIRS was conducted in Northern Ireland in 1987 and was reported in Tipping and McCorry (1988).

Primary analysis

The primary analysis for each of the three WIRS surveys has been conducted by a small team of researchers drawn from the Department of Employment, the Policy Studies Institute and, latterly, the Advisory, Conciliation and Arbitration Service. The 'sourcebooks' (Daniel and Millward 1983; Millward and Stevens 1986; Millward et al. 1992) have been commercially published with the four sponsors as joint copyright holders. The books range in length from 350 to over 400 pages. They contain a descriptive overview of the survey results, based on tabular analysis, as well as detailed descriptions of the design and conduct of the surveys. On substantive matters the later volumes have concentrated on making comparisons between the most recent and earlier surveys, setting the findings in the context of economic, social and legislative developments in the country.

Secondary analysis of WIRS

Within a year of their delivery to the research team responsible for the primary analysis and initial report, the WIRS micro-datasets have each been made available through the UK ESRC Data Archive to other researchers⁵. The 1980 and 1984 datasets have been widely used by British labour economists and to a much lesser extent by industrial relations specialists, sociologists and industrial geographers (Millward 1992). Secondary analysis of the 1990 survey data began in early 1992 and the first conference discussing early findings was held at the London School of Economics in January 1993.

Secondary analysis of the earlier surveys has not been confined to Britain; some has been carried out by researchers in other countries, notably the United States, Italy and Australia.

Trade unions and wages

Pay has been an enduring interest of economists since the discipline's earliest days. Low pay and poor working conditions gave rise to the birth of trade unions in the nineteenth century and the emerging discipline of labour economics began assessing the effect that they had on wage levels. In the United States the size of the "union wage differential" was the subject of a mushrooming literature (Lewis 1963; 1986). Initially it was based upon aggregate, industry-level data. Subsequently, research was facilitated if not stimulated by the growing availability of large-scale micro-datasets. Most of these were of individuals, but some were of employing units: for example, the Expenditures for Employee Compensation Surveys. In Britain the parallel literature on the union wage

differential was also initially based upon aggregate industry data and subsequently expanded when surveys of individuals became available. It was only with the advent of the Workplace Industrial Relations Surveys in 1980 that establishment-level micro-data were brought to bear on the issue.

The pay questions in the 1980 survey were not designed specifically for statistical estimation of the size of union wage differentials, but rather as a general indicator of whether an establishment was a relatively high or low-paying employer. When the potential of the survey for analysing the possible effects of trade unions on wages became apparent, the survey questions in the next survey (in 1984) were made more precise and elaborated with follow-up questions on hours of work. Thus whereas in 1980 respondents were asked "over the last month what has been the gross pay of the typical semi-skilled manual worker" (and similarly for three other occupational groups), in 1984 the questions were as follows:

"what are the gross earnings, inclusive of any bonus or overtime, of a typical man/women in this group?"

A prior question had established whether the group of semi-skilled manual workers, for instance, was predominantly male or female. After the question on the typical level of pay the respondent was asked two further questions:

"about how many hours per week, would the typical male/female employee have worked to have earned that amount?", and

"how many of these hours would be paid overtime?"

The 1990 survey had very similar questions, but made clear that typical was to be interpreted as the median.

The question on levels of earnings has given rise to more secondary

analysis and more published papers than any other question or topic in the WIRS series. In a bibliography of analyses based on only the first two surveys compiled in July last year (Millward 1992) there were 11 articles in refereed academic journals on union wage differentials that depended wholly on WIRS. This compared with 31 refereed journal articles on all the rest of the material covered by the surveys, including those by industrial relations and other scholars as well as by labour economists.

In broad terms the studies based on the 1980 and 1984 surveys pointed to an average union wage differential for semi-skilled workers of a little under 10 per cent; for unskilled or skilled manual workers and for clerical and administrative staff the average differentials were smaller and often not statistically significant.

The rich vein of information in the survey datasets on the characteristics of bargaining structures and trade union organisation within and beyond the workplace has enabled labour economists to analyze and decompose the union wage differential in ways that could not be done with individual-level data. The most recent published articles are Blanchflower, Oswald and Garrett, 1990; Stewart, 1991; Metcalf and Stewart, 1992; and Paci et al., 1993. A summary is given in Metcalf, 1993. In the analyses reviewed by Metcalf the union wage differential was shown to be at its highest in 'pre-entry closed shops', where union membership is a hiring requirement. Such arrangements, and other weaker forms of 'compulsory unionism', have now been made unlawful. In the absence of a closed shop, semi-skilled manual workers only achieved a significant advantage in unionized workplaces if they had very high levels of membership:

95 per cent or more. Where more than one union organized workers at the same workplace they achieved a larger pay premium if they bargained separately with management than if they bargained jointly (Machin, Stewart and Van Reenen 1992). Monopoly or near monopoly product markets increased the unions' ability to achieve higher pay. So did higher than average financial performance by the firm. High local unemployment constrained the unions' ability to raise wages.

Results such as these have contributed much to discussion of the role of trade unions in wage-setting in Britain. Some of them have been quoted by the government in support of successive legal restrictions on trade unions and especially on the closed shop. But the WIRS-based literature so far has contained a major confusion which, in the author's view, puts many of the findings in doubt.

The confusion referred to is a confusion between wage rates and earnings. Where published papers have contained an initial section on the economic theory underlying the expectation of a union wage differential it has almost invariably been concerned with the wage rates that trade unions negotiate with employers⁶. The union wage rate has been compared with the (unobservable) wage rate in the absence of unions in the same employment situations. Following Lewis (1963; 1986) this has been operationalized in terms of the wage rate in 'comparable' non-union employment.

Wage rates for manual workers, whether union-negotiated or not, are almost invariably stated in monetary amounts per hour worked. Generally these hourly rates are for a standard or normal working week (whether for full-time or part-time employment). Commonly the hourly rate is raised for hours worked

in addition to standard hours; 'overtime premia' of one and a half times the standard hourly rate are common in Britain.

Earnings are, in essence, the product of wage rates and hours worked. There may be other minor elements of earnings such as performance-related bonus payments and allowances, which may be negotiated in unionized employment, but the essential reality for most employees is that earnings are a product of the rate of pay and the number of hours worked⁷.

There is enormous variation in hours worked in Britain. The weekly gross earnings data for the typical semi-skilled worker in the WIRS surveys arise from a mixture of part-time and full-time employees; some full-time workers worked very long hours, some of which were paid overtime hours. In fact the hours worked by the typical semi-skilled worker whose earnings were recorded in the 1990 survey varied from 11 hours to 91 hours per week⁸. The mean in the union sector was 6 per cent higher than in the non-union sector.

Yet despite the large variation in hours worked, economists have continued to estimate union wage differentials from WIRS exclusively on the basis of weekly earnings. This was necessary in case of the 1980 survey because it contained no corresponding questions on hours worked. But from 1984 onwards the surveys did contain such questions and the improved data were enthusiastically anticipated: "The 1984 survey will also permit the decomposition of the union/non-union differential in weekly pay into that in hourly pay and that in the number of (basic and overtime) hours." (Blanchflower 1986). Yet, surprisingly, not a single published paper has reported WIRS results based on hourly wages, although Blanchflower, Oswald and Garrett (1990) note that "a

number of experiments with hourly wage equations were conducted, and the results were the same ..." Nor, as a second-best solution, does any contain a wage equation with hours worked as an explanatory variable for weekly earnings. In the author's view at least, the size and maybe even the existence of the trade union wage premium in Britain remains in doubt until it has been properly investigated using an appropriately defined dependent variable or equivalent controls.

Finally on the subject of trade unions and wages, the issue of the dispersion of wages has begun to be addressed through the WIRS establishment-level data. The first two surveys contained no explicit question on wage dispersion and no attempt was made until recently to use the data on pay levels for different occupational groups to examine pay differentials or dispersion. The issue of whether unions reduced the dispersion of wages had only been addressed in the UK at the aggregate level using individual data (Metcalf 1989). The parallel issue at the level of the establishment had to await an additional question in the 1990 survey⁹. The results, reported in aggregate in the 1990 survey sourcebook, confirm the expectation based upon the American literature, that wage dispersion is substantially lower in unionized workplaces. Recent econometric analysis has confirmed that this relationship is robust to the inclusion of numerous control variables (Gosling and Machin, 1993).

Payment systems and non-wage benefits

Other elements of the reward structure have received less attention than

wage levels. There has been no consistent questioning in the survey series to reveal the incidence of occupational pension schemes, sick pay and the like. However, the 1990 survey contained some new questions on these matters, designed to illuminate the differences in treatment between occupational groups. Initial econometric analysis of these data confirm the association between trade union presence and the availability of fringe benefits, well established in the USA from the work of Freeman and others (Casey 1993). The determinants of whether unions are able to negotiate extra-statutory redundancy payments has been examined by Booth and Satchell (1987) using the 1984 WIRS.

Whilst the surveys have included a variety of information about different types of payment system, the one that has been the focus of attention by economists has been profit-related pay. This, together with employee share ownership, has been intensively analyzed, both in terms of its determinants and its consequences. Responding to the debate engendered by Weitzman's (1984) book and British government proposals for further tax incentives for employee share ownership plans (ESOPs), Blanchflower and Oswald (1987) used the 1980 WIRS data to determine whether the existence of such schemes had beneficial effects on employment and investment. They could find none. Subsequent examination of profit-related cash payments showed no discernible effects on corporate financial performance or a number of other important economic indicators (Blanchflower and Oswald 1988). Other analysts of the 1984 survey identified a role for trade unions in whether the various types of scheme were present, as well as a number of other determinants (Gregg and Machin 1988).

Unions and employment

The existence and size of a trade-off between pay and jobs has been a matter of contention within economics for a long time. Unions have been seen by many as being at the heart of this trade-off. It is therefore surprising that some time elapsed before the WIRS surveys were used to examine the association between union presence and employment growth or decline. A simple but striking tabulation of union density and employment change in the sourcebook on the second survey (Millward and Stevens 1986, p. 58) suggested that unions were strongly associated with declining employment in the private sector of the economy. Subsequent econometric analysis has shown that the effect is robust to a large number of controls and that the *ceteris paribus* employment growth differential arising from union recognition is of the order of minus 3 percentage points per annum (Blanchflower, Millward and Oswald 1991)¹⁰. This is similar in magnitude to that subsequently found in the first US micro-economic study of this issue (Leonard 1992) which was based on a compilation of administrative records on manufacturing establishments in California in 1982.

Economic performance

Nationally representative micro-data on the performance of economic units, where available, are most common at the level of the enterprise or company. At this aggregated level it is difficult to investigate the impact of management and labour relations because, *inter alia*, these features may vary widely within multi-site enterprises. No single level of data collection and analysis is appropriate for addressing the issues of corporate performance. The

theoretical entity of much micro-economic theory - the firm - has no clear real-life referent; it certainly does not coincide with any economy-wide standard statistical data units. But in so far as individual workplaces do coincide with economic decision-making units, there seemed good reason to collect in WIRS some rudimentary information on their performance so that evaluation of labour relations practices could include some reference to their economic impact.

In the first survey in the WIRS series a single question of this type was addressed to the management respondent who, it should be remembered, was the most senior manager dealing with personnel or labour relations matters, although in most cases had broader management responsibilities. It was confined to those working at establishments in industry and commerce, thus excluding non-trading establishments in the public sector. The question was:

"How would you assess the financial performance of this establishment, compared with other establishments and firms in the same industry?"

Responses were coded on a 3-point scale: *better than average*, *about average* or *below average*.

It should be of no great surprise that such a rudimentary question had severe limitations. Besides the crudity of the measurement, it had a high level of non-response, particularly in three types of workplace: a) those belonging to state-owned and other monopoly industries, b) in head-offices and other administrative units of large enterprises, these usually having no observable output of goods or services on which to base an assessment, and c) workplaces whose ownership status was in the category "trust or company limited by guarantee". These were all cases where the question as posed was inappropriate to a greater or lesser degree. Where there were valid responses, however, the

pattern of variation seemed plausible and some results indicating that financial performance was lower in unionized workplaces were reported in the initial sourcebook (Daniel and Millward 1983, pp. 258-60).

The question was modified in the 1984 survey in two ways. The three-point measurement scale was changed to a five-point scale by adding a follow-up question where the response was either above or below average: "is that a lot better than (below) average or a little better (below)?". This follow-up had very little non-response (2 per cent of those asked), giving improved measurement overall. Secondly, two response categories were added for the use of interviewers when the respondent could not give a scalable response: *no comparison possible* and *relevant data not available*. As Table 1 shows, this confirmed that the question was being asked in inappropriate circumstances, rather than non-response being due mainly to respondents having insufficient information on which to make a judgment. As a consequence the clearest cases where the question was inappropriate (head offices and other administrative units) were filtered out of the question in the third survey.

Table 1 Summary of managers' assessments of the financial performance of their workplace

	1980	1984	1990
Better than average	37	39	42
Average	37	39	28
Below average	5	6	5
No comparison possible	3 *	11	11
Relevant data not available	.. **	3	4
Don't know / not answered	17 ***	3	4
Not asked	-	-	7
<i>Base: all establishments in industry and commerce with 25 or more employees</i>			
<i>Unweighted base</i>	<i>1464</i>	<i>1385</i>	<i>1510</i>
<i>Weighted base</i>	<i>1432</i>	<i>1373</i>	<i>1452</i>

Source: Workplace Industrial Relations Surveys, 1980, 1984 and 1990. The 1980 and 1984 responses are those of the principal management respondent. The 1990 responses are those of principal management respondents or financial managers.

Notes: * Recoding of 'other answers'.

** Not separately coded.

*** Columns may not total 100 per cent because of rounding.

Economists became interested in the data from this question when the results of the second survey were released. Initially the subject of a doctoral thesis, the determinants of financial performance, as measured by this perceptual question, were modelled econometrically. As with the earlier interest in pay, the focus was the association with trade union activity or, more controversially, the effect of trade unions. Scepticism about such a crudely measured variable was moderated as a result of the analysis:

"Despite the reduced information provided by a categorical variable such as this relative to a continuous profit measure, and the subjective nature of the question, it still possesses useful information pertinent to an empirical analysis of financial performance. Given anomalies associated with accounting measures of profitability and census-based price-cost margins, this type of information has advantages as well as disadvantages, and provides a useful counterpoint to the more conventional measures. In particular, it reflects what managers actually consider to be financial performance and, even if this is a mixture of various indicators like accounting profits, productivity and cash flow, this is of considerable interest in itself. It obviously provides a rather noisy signal of financial performance, but if meaningful results can be extracted despite the noise, this provides useful evidence ..." (Machin and Stewart 1990).

Commenting on the skewed distribution of the responses (as shown in Table 1) they continued:

"Survey respondents may be prone to overstate (or understate) their own establishment's financial performance. However, as long as such reporting errors are non-systematic and uncorrelated with the explanatory variables to be used, these managerial responses provide an unbiased estimator of the relative financial performance of establishments that can be used without worry of measurement-error biases. To examine this, diagnostic tests for systematic heterogeneity in the thresholds distinguishing performance categories are reported in the empirical work that follows. These tests generate confidence in the use of the performance measure as they are generally unable to detect any heterogeneity in the estimated thresholds from the econometric model used."

Summarizing their analysis of manufacturing establishments in the 1980

and 1984 surveys Machin and Stewart found that:

"unionized establishments are characterized by lower performance levels than non-union concerns. ... the ability of unions to extract a share of the available rents is found to be greater if the plants in which they are located possess a higher market share."

This work provided reassurance that questions about economic outcomes and conditions were a valuable part of the WIRS design and led to suggestions for collecting more information of this type in the 1990 survey. The work was also the first of a number of pieces of econometric analysis where industry-level variables derived from census and other government statistical sources were spliced on to the WIRS datasets to enhance their explanatory power¹¹.

Other economic variables included in the first two surveys and which have been the focus of similar analyses are corporate takeovers, investment, technical innovation and organizational change (Holl and Pickering 1991; Denny and Nickell 1991; Latreille 1992; Machin and Wadhvani 1991a and b).

Strikes

If wages are one of labour economists' greatest preoccupations, strikes are usually not far behind. The 1980 WIRS was designed at a time of widespread strike activity and intense political concern about it. The questionnaires used in interviews with both managers and worker representatives asked about the frequency and characteristics of both strikes and non-strike industrial action; broadly similar questions have been repeated since. The results have illuminated the causes and consequences as well as the nature and conduct of industrial disputes in ways not possible with other existing datasets¹².

Secondary analysis of these data by economists has focussed mainly on the strike propensity of workplaces. Findings have related this to a wide range of factors including types of trade union organisation, bargaining structure, payment systems, dispute-resolution procedures and economic conditions (Blanchflower and Cubbin 1986; Booth and Cressy 1990; Dickerson and Stewart 1992; Metcalf 1993).

Enhancement of the economic context and performance measures in the 1990 survey

A conference held in 1988 to discuss the results of WIRS secondary analysis and developments in the design of the series produced strong support for extending the range and types of economic information to be collected in the next survey. A large number of suggestions were piloted and many adopted, the most fundamental being the addition of a second management interview to the survey design. This was to be with the senior financial manager at the workplace. When translated into a practical element of the 1990 survey design the requirement became an interview with a financial manager where the main respondent was a specialist personnel or labour relations manager; in other cases the main respondent was usually a general manager and therefore expected to be able to furnish the most essential pieces of information.

Financial manager interviews were required only in industrial and commercial establishments, of which there were 1510 in the achieved sample. At 667 of them the main management respondent was a personnel specialist, but in 66 of these there was no identifiable financial manager at the establishment. Of the remaining 601 establishments, financial managers were interviewed in 454 cases, a success rate of 76 per cent. However, in 83 of the cases where a financial manager could not be interviewed the main respondent agreed to answer an abbreviated set of equivalent questions. On these questions, therefore, the dataset is virtually complete.

The financial manager interviews lasted about thirty minutes on average (about a third of the length of the main respondent interviews) and contained a

wide range of factual and perceptual questions. Few results have yet been published. This is because the primary analysis concentrated on labour relations structures and practices using data available from all three surveys. And secondary analysis has only been possible since February 1992 when the data were first released. However, initial users of the dataset have expressed considerable interest in the financial manager data.

Brief examination of some of the new questions asked of financial managers has led to a number of useful findings. The first concerns the type of economic unit which occurred in the sample of cases where financial managers were interviewed. The distribution of responses to the question, "which of these phrases best describes the financial status of this establishment?" was as follows:

	Percentage
Single cost centre	20
Several cost centres	13
Single profit centre	32
Several separate profit centres	6
Company with right to re-invest profits	10
Entire company (sole establishment)*	9
Other answer	2
Not answered	8

* These cases were skipped past this question; the response can be inferred.

These results confirm the expected variety of financial unit and show how inappropriate it would be in a survey of establishments to rely on financial performance measures that assumed a single type of unit. In particular it shows that reliance on a profits-based measure of performance would be inappropriate

for about one third of this particular sample because they were cost centres and simply were not accounting units where profits were measured. Indeed, it would only be reasonable to assume that 57 per cent of the sample of respondents (the third to the sixth rows in the table) could attempt to answer a question on the rate of profit of their establishment because only in these cases did the establishment coincide with a profit centre or company for accounting purposes.

In fact the next item in the financial manager interview put just such a question to this subset of respondents. The question was, "In the last financial year what was the approximate gross rate of return on capital here?" The response pre-codes were in bands of five per cent between zero and 25 per cent; the lowest and highest codes were *less than zero* (to cover loss-making situations) and *25 per cent or more*. Non-response to this question amounted to 20 per cent of cases. Thus valid data were obtained in only 80 per cent of the 57 per cent of financial manager interviews where a question about the recent profitability of the establishment was an appropriate question: 46 per cent of all cases where a financial manager was interviewed. This reinforces the argument in favour of the subjective financial performance measure, where 85 per cent of respondents were able to give an answer.

An additional argument in favour of the subjective financial performance measure is that it incorporates a comparative element, asking for a judgment in relation to other workplaces or firms in the same industry. To convert a profits-based absolute measure, such as the one mentioned above, into a standardized one would require one to compare the response in each case with those from other establishments in the same industry. There would be a great deal of

arbitrariness in choosing a sensibly defined 'industry' for this purpose; one suspects that industries defined for government statistical purposes do not always - even usually - coincide with the competitive boundaries of product markets; the latter are generally much more specific than the former. In addition, there would be many industries where the number of cases forming the comparator group would be too small to form a robust statistical base for a comparative profitability measure.

To summarize, the subjective measure of financial performance is applicable to a much wider range of economic units than a profit-based measure, has less of a non-response problem and contains a comparative element with reference to the product market as defined by those involved in management decisions. It also by-passes the many accounting issues that arise in the measurement of profitability.

The WIRS question on relative financial performance has been discussed here at some length because it is the economic outcome question on which there is most experience in the WIRS series and because that experience has led to some refinement of the question and an appreciation of the circumstances in which respondents find the question difficult to answer. It is not the only economic outcome question that was asked in the 1990 survey. Other important economic variables that were incorporated into similarly-phrased questions included:

- a) the level of costs compared with other similar workplaces;
- b) labour productivity compared with similar workplaces;
- c) labour productivity compared with 3 years ago at the same workplace.

On the last two of these there was a follow-up question seeking the

respondent's main reasons for his or her rating. These, and many of the other questions in the financial manager questionnaire have yet to be evaluated and exploited.

Besides the addition of the financial manager interview in the 1990 survey, a second method of obtaining economic information was tried at the pilot stage. This involved a two-page self-completion questionnaire that was left behind at the end of the interview. It contained 16 questions, based on the *Census of Production*, asking for financial information covering sales, costs and stocks in relation to the most recent financial year. Despite diligent chasing by interviewers, few of these were returned fully completed. As a result this instrument was abandoned for the main stage of fieldwork.

Conclusions

Experience with the British Workplace Industrial Relations Survey series has demonstrated the usefulness of nationally representative, establishment-based interview surveys for a number of different purposes. Few would argue that the WIRS surveys have not proved their worth in the field of labour relations, on which they have largely been focussed. But they have also been used to address important issues that were not the *raison d'être* of their design. These include the union wage premium, numerous other 'effects' of trade union representation, and a range of sources of influence upon economic performance at the micro-level. Their utility for addressing issues in both labour economics and in main-stream economics is well testified by the rising number of research papers that use them. Moreover, the status of the academic and policy analyses based upon them is greatly enhanced by the fact that the WIRS series is founded on proper, nationally representative, probability samples.

Clearly the range of information obtainable through establishment-level surveys is limited. And using face-to-face interviews, especially with multiple respondents, is expensive. But, in the author's view at least, workplace-based surveys have a key role in understanding the labour market and the real economy, a role that is now becoming more widely recognized in Britain and other countries, if not yet in North America¹³.

ENDNOTES

1. Neil Millward is a Senior Fellow at the Policy Studies Institute and a Research Associate of the Centre for Economic Performance. The author would like to thank colleagues at the Policy Studies Institute and the Centre for Economic Performance for comments on an earlier version and the Leverhulme Trust and the Centre for Economic Performance for financial support. The Centre for Economic Performance is financed by the Economic and Social Research Council.
2. Academic interest in labor relations policies led to the development of two enterprise level surveys in 1985 and 1992. Analysis of the first of these was reported in Marginson et al. 1988. Neither of these surveys, however, is based on a nationally representative probability sample.
3. There were 48 cases included in both the main cross-sectional sample and the panel sample.
4. Many of the methodological and practical issues addressed in gaining access to the sample of employers are discussed in Millward, 1991.
5. Technical reports and copies of the three sets of questionnaires, as well as the complete micro-data from the three surveys, are available at cost from the ESRC Data Archive at the University of Essex. Enquiries should be made to The Director, ESRC Data Archive, University of Essex, Wivenhoe Park, Colchester, Essex C04 3SQ quoting Study Nos. 1575 for the 1980 survey, 2060 for the 1984 survey and 2858 for the 1990 survey.
6. In many cases the theoretical discussion simply refers to 'the wage'. In others the terms 'wage rate' and 'earnings' are used interchangeably.

7. One of the rare groups of employees whose union-negotiated pay rates make no reference to standard or normal hours of work is university academics.
8. The longest hours were in civil engineering construction where the workers were doing 12-hour shifts, 7 days a week, with an hour per day overtime. Other, entirely plausible, cases of very long hours occur in the dataset. In Britain there are no general legal restrictions on hours worked.
9. This was proposed as a result of my experience in helping to design the Australian Workplace Industrial Relations Survey (Callus et al., 1991). Suggestions made at an NBER Labor Studies workshop in 1989 helped to frame the question.
10. Alternative analysis based on the same source (the 1984 WIRS) came to some different conclusions (Machin and Wadhvani, 1991).
11. The other main linkage besides industry (which in WIRS is coded at the 4-digit level) has been through locational codes. See, for example, Blanchflower et al. (1990).
12. The other main source of micro-data on industrial disputes in Britain is the Confederation of British Industry's Pay Databank (Ingram 1991).
13. A forceful plea for more data on the employers' (demand) side of the US labor market has recently been reiterated by Hamermesh (1993).

REFERENCES

- Blanchflower, D.G. (1986), "Wages and Concentration in British Manufacturing", Applied Economics, 18, 1025-1038.
- Blanchflower, D.G. and Cubbin, J. (1986), "Strike Propensities at the British Workplace", Oxford Bulletin of Economics and Statistics, 48, 19-39.
- Blanchflower, D.G., Millward, N. and Oswald, A.J. (1991), "Unionism and Employment Behaviour", Economic Journal, 101, 815-834.
- Blanchflower, D.G., Crouchley, R., Estrin, S. and Oswald, A.J. (1990), "Unemployment and the Demand for Unions", Cambridge, Mass., National Bureau of Economic Research, Working Paper No. 3251.
- Blanchflower, D.G. and Oswald, A.J. (1987), "Profit Sharing - Can It Work?", Oxford Economic Papers, 39, 1-19.
- Blanchflower, D.G. and Oswald, A.J. (1988), "Profit-Related Pay: Prose Discovered?", Economic Journal, 98, 720-730.
- Blanchflower, D.G., Oswald, A.J. and Garrett, M. (1990), "Insider Power in Wage Determination", Economica, 143-170.
- Booth, A.L. and Cressey, R. (1990), "Strikes with Asymmetric Information: Theory and Evidence", Oxford Bulletin of Economics and Statistics, 52, 269-291.
- Booth, A.L. and Satchell, S.E. (1987), "Layoffs with Payoffs: Explaining Redundancy Pay Negotiations - Evidence from the 1984 Workplace Industrial Relations Survey", London: City University, mimeo.
- Callus, R., Moorehead, A., Cully, M. and Buchanan, J. (1991), Industrial Relations at Work: the Australian Workplace Industrial Relations Survey, Canberra: Australian Government Publishing Service.

- Casey, B. (1993), Employers' Provision of Pensions and Sick Pay: Evidence from the 1990 WIRS, London: Policy Studies Institute, forthcoming.
- Daniel, W.W. (1987), Workplace Industrial Relations and Technical Change, London: Francis Pinter.
- Daniel, W.W. and Hogarth, T. (1991), "Worker Support for Technical Change", New Technology, Work and Employment, 5, 85-92.
- Daniel, W.W. and Millward, N. (1983), Workplace Industrial Relations in Britain: The DE/PSI/ESRC Survey, London: Heinemann Education Books, (second edition, Aldershot: Gower).
- Daniel, W.W. and Millward, N. (1993), The New Industrial Relations?, London: Policy Studies Institute, forthcoming.
- Denny, K. and Nickell, S. (1991), "Unions and Investment in British Manufacturing Industry", British Journal of Industrial Relations, 29, 113-121.
- Dickerson, A. and Stewart, M.B. (1992), "Is the Public Sector Strike Prone?", University of Kent at Canterbury, Studies in Economics No. 92/5.
- Ghobadian, A. and White, M. (1988), "Personnel Policies, Structural Characteristics and Equity in Job-evaluated Payment Systems", Personnel Review, 17, 29-32.
- Gosling, A. and Machin, S. (1993), "Trade Unions and the Dispersion of Earnings in UK establishments, 1980-1990", London School of Economics, Centre for Economic Performance,, Discussion Paper No. 140.
- Gregg, P.A. and Machin, S.J. (1988), "Unions and the Incidence of Performance-linked Pay Schemes in Britain", International Journal of Industrial

Organisation, 6, 91-107.

Hamermesh, D.S. (1993), Labor Demand, Princeton: Princeton University Press.

Holl, P. and Pickering, J.F. (1991), "Takeovers and Other Influences on Economic Performance: a Plant Level Analysis", Applied Economics, 23, 1779-1788.

Ingram, P. (1991), "Ten years of Manufacturing Wage Settlements", Oxford Review of Economic Policy, 7, 93-106.

Latreille, P. (1992), "Unions and the Inter-establishment Adoption of New Microelectronic Technologies in the British Private Manufacturing Sector", Oxford Bulletin of Economics and Statistics, 54, 31-51.

Leonard, J. (1992), "Unions and Employment Growth", Industrial Relations, 31, 80-96.

Lewis, H.Gregg, (1963), Unionism and Relative Wages in the United States, Chicago: University of Chicago Press.

Lewis, H.Gregg, (1986), Union Relative Wage Effects, Chicago: University of Chicago Press.

Machin, S.J. and Stewart, M.B. (1990), "Unions and the Financial Performance of British Private Sector Establishments", Journal of Applied Econometrics, 5, 327-350.

Machin, S.J., Stewart, M.B. and Van Reenen, J. (1992), "The Economic Effects of Multiple Unionism: Evidence from the 1984 Workplace Industrial Relations Survey", London School of Economics, Centre for Economic Performance, Discussion Paper No. 66.

Machin, S.J. and Wadhvani, S. (1991), "The Effects of Unions on Investment and Innovation: Evidence from WIRS", Economic Journal, 101, 324-330.

- Machin, S.J. and Wadhvani, S. (1991), "The Effects of Unions on Organisational Change and Employment", Economic Journal, 101, 835-854.
- Marginson, P., Edwards, P.K., Purcell, J. and Sisson, K. (1988), Beyond the Workplace: Managing Industrial Relations in the Mult-establishment Enterprise, Oxford: Blackwell.
- Metcalf, D. (1989), "Trade Unions and Economic Performance: the British Evidence", LSE Quarterly, Spring.
- Metcalf, D. (1993), "Industrial Relations and Economic Performance", British Journal of Industrial Relations, 31, forthcoming.
- Metcalf, D. and Stewart, M.B. (1992) "Closed Shops and Relative Pay: Institutional Arrangements or High Density?", Oxford Bulletin of Economics and Statistics, 54, 503-516.
- Millward, N. (1991), "Sampling Establishments for Social Survey Research", The Statistician, 40, 145-152.
- Millward, N. (1992), A bibliography of Analyses based on the British Workplace Industrial Relations Surveys, London: Policy Studies Institute.
- Millward, N. and Stevens, M. (1986), British Workplace Industrial Relations 1980-1984: The DE/ESRC/PSI/ACAS Surveys, Aldershot: Gower.
- Millward, N., Stevens, M., Smart, D. and Hawes, W.R. (1992), Workplace Industrial Relations in Transition: the ED/ESRC/PSI/ACAS Surveys, Aldershot: Dartmouth Publishing.
- Paci, P., Wagstaff, A. and Holl, P. (1993), "Measuring Union Power in British Manufacturing; a Latent Variable Approach", Oxford Bulletin of Economics and Statistics, 55, 65-85.

- Smart, D. and Stevens, M. (1992), A Guide to Questions in the Workplace Industrial Relations Survey (WIRS) Series, London: Employment Department.
- Stafford, F. (1986), "Forestalling the Demise of Empirical Economics: the Role of Microdata in Labor Economics Research", in Ashenfelter, O. and Layard, R. (eds.) Handbook of Labor Economics, Amsterdam: North-Holland Publications.
- Stewart, M.B. (1991), "Union Wage Differentials in the Face of Changes in the Economic and Legal Environment", Economica, 58, 155-172.
- Tipping, B. and McCorry, P. (1988), Industrial Relations in Northern Ireland: The LRA Survey, Labour Relations Agency, Belfast.
- Weitzman, M.L. (1984), The Share Economy, Cambridge, Mass.: Harvard University Press.
- Whitfield, K., Marginson, P. and Brown, W. (1992) "Workplace Industrial Relations under Different Regulatory Systems - a Survey-based Comparison of Australia and Britain", paper presented to the World Congress of the International Industrial Relations Association, Sydney.
- Wood, D. and Smith, P. (1989), "Employers' Labour Use Strategies: First Report of the 1987 survey", London: Department of Employment, Research Paper No. 63.