

STATISTICS OF EMPLOYMENT IN BUSINESSES - DENMARK

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KEY WORDS:

compilation of new annual employment statistics on the basis of register-based data offers new potentials combine data on businesses and persons

1. Background

The system for person statistics

At the beginning of the 1970s Danmarks Statistik began setting up a register system for persons statistics based on the personal registration number as identifier.

In 1968 the personal registration number was introduced as identifier in the general administration system of persons, and within very few years was introduced as identifier of persons in more and more administrative systems throughout the 1970s. A range of registers of persons, whose direct or indirect purpose was to provide statistical information, were also set up during this period. Finally, at the end of the 1970s pure statistical registers, whose main purpose was to form the basis for compilation of statistics, were established. The unique personal registration number was linked to all register-based data on persons.

Danmarks Statistik took at a very early stage initial steps to use the registers, which had been set up, for statistical purposes.

The personal registration number was, as mentioned, the key to linking the registers. This implies that a coherent data set can be constructed, where all variables from each of the registers form the basis for a complete compilation of the statistics.

The majority of the registers contain information for an annual period or a fixed point in time during a year. Other registers contain events during the course of a month or a quarter.

The registers are used as basis for current compilations of individual statistics, e.g., unemployment statistics and birth statistics.

Register-based data form the basis for the population census conducted in 1980

Linking information from different registers made it possible to compile new statistics, and at the end of the 1970s the register system was so highly developed

that Denmark, as the first country, could replace the questionnaire-based population censuses with register-based censuses. The last questionnaire-based population census in Denmark was conducted as long ago as 1970. Moreover, the register-based data make it possible to compile population statistics annually.

Utilization of administrative information in the production of statistics

As it appears from the above-mentioned, Danmarks Statistik has utilized data stored on administrative registers for statistical purposes. As a result of this, businesses and institutions, which have already submitted information to a public authority, do not have to submit the same information to the statistical authorities.

In addition to reducing the response burden the utilization of administrative data results in a heavy reduction of the costs involved in the production of statistics.

However, it is an essential precondition for utilizing administrative data as statistical basis that a high data quality is ensured. In Denmark, the Act on Danmarks Statistik provides that Danmarks Statistik "shall be in charge of, or assist in, the setting up and utilization of public authorities' central registers, which serve the performance of administrative functions in relation to the general public or the business sector, and which can be utilized for statistical purposes". This provision makes it possible for Danmarks Statistik to influence the construction and contents of public administrative registers, and therefore, Danmarks Statistik can assist in constructing the registers in the most appropriate way and with the contents that can be utilized with regard to the production of statistics.

It is our experience that close contact with the persons responsible for operating the public registers leads to good results, not only in connection with regard to construction of registers, but also in connection with the continuous updating of the registers. A close and continuous contact between the statistical bureau and the public authorities responsible for operating the register ensures a comprehensive knowledge of the definitions and concepts used in the administrative registers, and it becomes easier to detect any defects in the register.

Finally, it must be emphasized that it is necessary to effect a thorough error-search of the information on the registers, before they can be utilized in the production of statistics. In this error-search process there is continuous contact with those operating the registers and in a number of cases also the respondents. A systematic and careful error-search implies that misunderstandings and systematic faults can be rectified in subsequent register-versions.

2. The register-based labour force statistics

Danmarks Statistik's annual employment statistics are also compiled on the basis of data contained on registers. The register system is made up by linking a number of administrative and statistical registers. For the same person, information is available on simultaneous occupations in cases, where a person, e.g. holds a primary as well as a secondary occupation. In such cases, it is decided on the basis of fixed guidelines which of the 2 occupations indicates the primary occupation and which indicates the secondary occupation. The information provides the basis for a characterization, which for a person indicates an overall classification or description of a person's status in relation to the labour market at a fixed point in time during the year (end of November).

In the fully completed statistical register up to 2 occupations for each person are indicated, whereas the primary data may contain more than 2 simultaneous occupations. The statistical register makes it possible to compile statistics on, e.g., **sex**, **age**, **residence** and **workplace** (region, municipality, exact address), **education**, **socio-economic group** (self-employed, assisting spouse, salaried employees in upper levels, salaried employees in intermediate levels, other salaried employees, skilled manual workers, unskilled manual workers, employees in employment not further specified), **industry of the workplace**, and a range of other variables linked to the person or the occupation.

The annual employment statistics cover the whole Danish population and are called the register-based labour force statistics.

3. Register-based employment data

Information on the industry of the workplace is obtained from the Central Register of Enterprises and Establishments, as the identifier of the workplace on

the register appears with a key relating directly to the units on the Central Register of Enterprises and Establishments, where all units are recorded with exact address and industry, and with other data concerning the enterprise.

For each employee there is thus information relating to the person, to the specific occupation, and the workplace to which the employee is linked. In order to achieve an adequate quality of the final product **the Central Register of enterprises and Establishments must contain updated information on all business units as detailed as the level of workplace.**

4. The workplace project - updates data on persons as well as workplace data

Private employers

Workplace data are updated annually in connection with the workplace project. As regards employees employed with private employers, the basis of the workplace project is the annual pay declaration slips, which all employers must submit annually to the Ministry of Taxation, Central Customs and Tax Administration for each employee. The pay declaration slip contains information identifying the employee (personal registration number) as well as the employer (employer code number). For employers with more than one workplace, it must also be indicated by means of a workplace code to which one of the workplaces the pay declaration slip relates. Together with the annual pay declaration slips, Danmarks Statistik submits annually to each employer, who has several workplaces a "list of workplaces" indicating which workplace codes the employer has to use for each workplace. The list of workplaces is prepared on the basis of information from the Ministry of Taxation, Central Customs and Tax Administration concerning active business numbers combined with information on workplaces obtained from the Central Register of Enterprises and Establishments. Employers are asked to update the list of workplaces by indicating workplaces which have been set up or have ceased to exist, so that the corrected list of workplaces for the enterprise contains the units, where the employees have been engaged during the survey period (the year). Hereafter, the employer indicates the relevant workplace code for each employee.

Public employers

For public employers, the annual pay declaration slip is not used directly as basis for statistics of workplaces. Institutional registers maintained in accordance with special rules are used instead and workplace data are recorded on the Central Register of Enterprises and Establishments for the public workplaces in a separate section, which is updated annually at the level of workplace.

Corrections of the workplace data

When Danmarks Statistik has received the primary data from the private and public employers, the data are subjected to a comprehensive check, revision and error-search. The annual workplace project results in corrections and additions to the previously submitted information on workplaces.

5. Workplace data are continually updated

The workplace data contained on the Central Register of Enterprises and Establishments are continually updated with information on workplaces abstracted from, e.g., the industrial statistics and the accounts statistics for industrial enterprises and with data reported by the Ministry of Taxation, Central Customs and Tax Administration concerning business units which have been set up, changed or have ceased to exist.

Industrial information

In connection with the registration of businesses, industrial information is included in addition to information on name, address and type of ownership. Industrial information is available and updated at the enterprise level as well as the workplace level. Updating of industrial information concerning existing units is effected regularly by means of questionnaires forwarded to the industries. In connection with the transition to a new common EEC classification of all economic activities, a comprehensive industrial coding was effected in Denmark in 1992, and questionnaires were forwarded to the industries covering about 100,000 business units.

Self-employed persons and assisting spouses

Self-employed persons are included on the Central Register of Enterprises and Establishments as either employers (as mentioned above), VAT-registered persons or other self-employed persons, who are neither employers nor VAT-registered persons, but who are registered, in accordance with special legislation, as being engaged in business activities.

The delimitation of assisting spouses is effected on the basis of information on earnings in the tax system, and assisting spouses are classified to the same workplace as the spouse. This is carried out on the basis of information from the Central Population Register, where spouses by means of personal registration numbers refer to each other.

6. Workplace statistics

On the basis of more or less the same primary data annual workplace statistics were compiled during the years 1980 - 1989 concurrently with the register-based labour market statistics. The two statistics show employment seen from the point of view of the person as well as the business unit, respectively. The two annual statistics were compiled on the basis of the same primary data, but the processing and the subsequent compilation of statistics of the number of employees and workplaces were, up to and including 1989, effected according to different principles.

The workplace statistics are extended and harmonized with the register-based labour force statistics

As from the 1990 statistics, the processing principles have been harmonized and the workplace statistics extended to include also self-employed persons as well as assisting spouses. Information on the self-employed will as regards both statistics be extracted from the Central Register of Enterprises and Establishments.

7. - and the workplace statistics become statistics of employment in businesses

The principal tabulation in the register-based statistics is the primary occupation (principal job), whereas the extended workplace statistics, which are called **statistics of employment in businesses**, and which as principal tabulation shows the number of

employees, viz. the primary **and** the secondary occupations.

The harmonization of the principles and methods of processing implies **firstly**, that there is complete consistency between the 2 statistics, **and secondly**, that it is now possible in the statistics of employment in businesses to link variables of persons to the occupation. As an example it can be mentioned that as a result of this it is now possible for a given industry to show for instance the number of business units within the size groups of the number of employees, with

distribution of the employees by occupation, education, sex and age.

The tables below illustrate the statistical possibilities offered by the new statistics of employment in businesses.

A distribution of the number of employees in each individual county analysed by sex can be made, by using the information from the personal code number (odd = men, even and zero = women), combined with the geographical code number for location of the workplace.

County of the workplace	Men	Women	Total
København	178904	165361	344265
Frederiksberg	20792	22587	43379
Københavns Amt	200066	163931	363997
Frederiksborg Amt	84658	75823	160481
Roskilde Amt	48386	46779	95165
Vestsjællands Amt	74188	62919	137107
Storstrøms Amt	65373	55475	120848
Bornholms Amt	13710	10536	24246
Fyns Amt	128522	108263	236785
Sønderjyllands Amt	74282	57756	132038
Ribe Amt	69835	54560	124395
Vejle Amt	100321	81908	182229
Ringkøbing Amt	87047	69342	156479
Århus Amt	178189	151474	329663
Viborg Amt	722291	55458	127749
Nordjyllands Amt	140022	112077	252099
Uden for landet	9159	1266	10425
Total	1545745	1295605	2841350

The corresponding distribution of employed persons resident in each individual county analysed by sex, is made, by using the information from the

personal code number, combined with the geographical code number for residence of the person. In this way, the following table can be constructed:

County of residence	Men	Women	Total
København	120357	112558	232915
Frederiksberg	24278	23224	47502
Københavns Amt	181827	166828	348655
Frederiksborg Amt	109792	96916	206708
Roskilde Amt	72341	63585	135926
Vestsjællands Amt	85196	68083	153279
Storstrøms Amt	73739	59202	132941
Bornholms Amt	13360	10519	23879
Fyns Amt	134923	109731	244654
Sønderjyllands Amt	75805	58640	134445
Ribe Amt	68767	53908	122675
Vejle Amt	102107	82255	184362
Ringkøbing Amt	87709	68904	156613
Århus Amt	181463	153096	334559
Viborg Amt	71555	55383	126938
Nordjyllands Amt	142526	112773	255299
Total	1545745	1295605	2841350

If the two tables are compared by deducting the figures in the table concerning residence from the figures in the table concerning place of work, a distribution by number of male and female jobs in the area is obtained, compared with jobs for the employed persons resident

in the area. Figures with an - indicates that the population net have jobs outside the area of residence, whereas positive figures indicate that the area attracts labour.

	Men	Women	Total
København	-58547	-52803	-111350
Frederiksberg	3486	637	4123
Københavns Amt	-18239	2897	-15342
Frederiksborg Amt	25134	21093	46227
Roskilde Amt	23955	16806	40761
Vestsjællands Amt	11008	5164	16172
Storstrøms Amt	8366	3727	12093
Bornholms Amt	-350	-17	-367
Fyns Amt	6401	1468	7869
Sønderjyllands Amt	1523	884	2407
Ribe Amt	-1068	-652	-1720
Vejle Amt	1786	347	2133
Ringkøbing Amt	662	-528	134
Århus Amt	3274	1622	4896
Viborg Amt	-736	-75	-811
Nordjyllands Amt	2504	696	3200

Another example of the possibilities offered by the new statistics is a distribution of the employed population analysed by completed education in selected industries. The matching is here the personal code number from the registers on education statistics and the employment statistics, respectively. It can thus be

said that in connection with the statistical matching, information on education is incorporated as a variable in the employment statistics. The industry is compiled by using a Danish version of the UN's ISIC-68, whereas the level of education follows the standard in the UN's ISCED-classification.

Table example:

Employed population by industry of the workplace and by highest level of education of the persons

Highest level of education	Building and construction		Manufacturing industries		Retail trade	
	Number	Pct.	Number	Pct.	Number	Pct.
Vocational education	76977	53,5	163827	44,5	48394	48,6
Short courses of further education	6255	4,3	16603	4,5	884	0,9
Medium-length courses of further education	4355	3,0	16814	4,6	1203	1,2
Long courses of further education	1522	1,1	10468	2,8	1091	1,1
No completed education, not started	54827	38,1	160173	43,5	47978	48,2
Total	143936	100	367887	100	99550	100

A final example of the possibilities offered by the statistics of employment in businesses for combining information on businesses and person is a distribution

of the employment situation by age groups within the industries "Restaurants and hotels" and "Finance and business services".

Age								
	Under 25 years		25 - 39 years		40 years		Total	
Industry	Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.
Restaurants and hotels	35622	45,4	21618	27,6	21177	27,0	78417	100
Finance and business services	35224	13,7	104509	40,6	117586	45,7	257319	100

It must be emphasized that the examples which have been chosen are not included in order to illustrate special conditions relating to the business statistics. Therefore, the figures are not decisive for the actual message: **The new statistics open up a range of possibilities of compiling detailed business statistics, combined with highly specified distributions of statistics on persons, which, e.g., can illustrate the qualification-structure of the industries.**

8. The development work on a general business-related system

In the spring of 1989 Danmarks Statistik began comprehensive development work on the setting up of a general business-related system, including extensions and modernizations of the Central Register of Enterprises and Establishments.

The total concrete results of the development work will first appear at the end of the completion of the project work, hopefully during 1993.

The statistics of employment in businesses is the first part of the harmonized general business-related statistics.

The statistics of employment in businesses are one of the new statistics resulting from the development work. The statistics have not yet been fully extended, as some of the methodological solutions are only temporary. However, with the 1990 and 1991 statistics, the main principles have been laid down, **and the first part of the harmonized general business-related statistics has now materialized.**

LABOUR INCOME SURVEYS IN THE UNITED KINGDOM

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1 INTRODUCTION

1.1 Wages levels in the UK have been monitored since the Middle Ages but the systematic collection and publication of wages statistics, and other statistics about the labour market, have only been in place for just over 100 years. There was a Census of Wages covering the earnings and hours of manual workers in 1886 and our regular statistical publication, Employment Gazette, was first published in 1893, as the Labour Gazette.

1.2 The early surveys focused on the need to obtain information on the hours and rates of pay of manual workers, the "wage-receiving classes". We still compile and publish a booklet of standard hours and rates of pay for workers covered by collective agreements, and it sells well. It is interesting to note that in the Carpenters' Hall in Philadelphia there is an information board which reports Thomas Jefferson's difficulty in obtaining a copy of the book giving pay rates for carpenters. He wanted to ensure that those working on the University of Virginia received a fair wage. He may have had difficulty in 1817 but today he would not as the Bureau of Labour Statistics publishes such data.

1.3 Over the years the emphasis has changed as the "typical worker" is no longer a male manual in manufacturing industry. Today in the UK only around 20 per cent of employees are in manufacturing and it is more difficult to classify occupations as manual or non-manual. Part-time women workers are now over a fifth of the workforce.

1.4 The official statistics have also changed over the years - in response to changing needs of users and in response to the pressures to reduce costs and the burden on businesses. Although we are government statisticians and the official statistics are stamped with the Government Statistical Service logo, the UK Government does not use our statistics to fix wages even in the public sector, apart from the police and the fire service. But the figures are important in pay bargaining and it is essential

that their integrity is accepted by both sides in negotiations.

1.5 In spite of a "hands-off" policy, the Government does need frequent, accurate, and timely data on earnings labour costs, and labour costs per unit of output. They and bodies representing workers and employers, use our statistics to monitor what is happening in the economy. Increases in average earnings are compared with the rate of increase in prices and our international competitiveness is monitored by calculating earnings per unit of output. In the past most users' needs could be satisfied with a single figure, or a simple time series but now they are demanding more detailed and timely figures. They want information on the composition and levels of pay for different occupations, industries, geographical regions, males and females, etc. The same is true of non-wage labour costs. It is important to include all the components on the input side of unit labour cost calculations.

1.6 Our current programme of establishment surveys to obtain data on earnings and labour costs consists of: the monthly Wages and Salaries Survey, the annual New Earnings Survey, and the four yearly Labour Costs Survey. For each of these surveys this paper presents a brief description of methods, inputs, outputs, shortcomings, and planned or recently introduced improvements.

1.7 We do not use only establishment surveys. We have just introduced questions into our quarterly Labour Force Survey in order to provide information on earnings, and non-wage income, linked to a wide range of social and economic variables. It, and other household surveys, also provide scope to obtain information on the income of families as well as individuals and to calculate income from all jobs.

1.8 We also get much useful data on income by sampling tax and social security records but there are potential problems in relying on

administrative records and household surveys. Household surveys rely on individuals being honest, co-operative, able to understand the concepts and definitions, and able to accurately recall earnings or to locate a record of earnings. Administrative records are rarely sufficiently up-to-date for short-term monitoring and rarely have all the detail required on employers, employees and components of earnings. So we have to rely on establishment surveys for most of our earnings and labour cost statistics.

2. The Survey of Wages and Salaries

2.1 This monthly survey uses a panel of some 8,000 firms or establishments, which between them employ around 40% of all employees in employment in Great Britain. The sample is periodically reviewed to make up for firms lost through closures, mergers etc, and its coverage has been extended twice (in 1976 and 1988) so that it now covers virtually the whole economy. As a statutory enquiry, the firms in the sample are required to respond and the response rate is virtually 100 per cent.

2.2 The probability of being selected increases with the size of the firm. In general the sample selects: all firms with more than 1,000 employees (except that a 1 in 4 sample is taken of homogeneous groups such as national and local government), 1 in 2 of firms with between 500 and 1,000 employees, 1 in 4 of firms with between 100 and 499 employees, and 1 in 20 of firms with between 25 and 99 employees. Firms with fewer than 25 employees are not covered; these account for 10 per cent of employees. The survey thus excludes services having mostly small firms, for example accountants, legal services, real estate, medical and dental services, and hairdressers. Sea transport and the Armed Forces are also excluded as the employees are not always resident in Great Britain. Firms in the sample remain in their initial size band until the sample is reviewed regardless of changes in their numbers of employees.

2.3 Because the statistics must be timely if they are to be useful, the **information collected** is rather limited: the total amount of wages and salaries paid to weekly paid employees in the last week of the month, and the equivalent total paid to monthly or 4-weekly paid staff in the month, plus the respective total numbers of employees these cover. Data are also provided on the amounts of holiday pay advanced and pay arrears. Employers are asked to indicate factors causing a significant change in their pay

bill. This gives some information on the impact of major bonus payments, but there is no systematic quantification of the components of earnings.

2.4 The data are collected via questionnaires which are addressed and enveloped by computer assisted procedures. In order to help respondents check their data before sending it to us, we print the last 2 months data onto the questionnaire. The computer system uses batch processing to capture, validate, and tabulate the data but the files are indexed to facilitate access to individual firms. Microcomputers are used to produce an underlying rate of change. Steps are in hand to introduce on-line data capture and validation, and to automatically issue reminder letters. In the not too distant future the system will be moved from the mainframe to PCs.

2.5 The survey is used to calculate a monthly Average Earnings Index (AEI) in order to study short-term movements in average earnings. The average is calculated simply as the estimated total pay bill divided by the number of employees; the base period (currently 1988) is set equal to 100 and index numbers are derived for each subsequent period (month). No account is taken of the structure of the labour force: part-time and full-time count equally.

2.6 The index uses employment weights which reflect the structure of the economy. The overall average is calculated by first calculating averages for industry groups (roughly 3-digit level in the International Standard Industrial Classification), taking account of the differing sampling fractions for the sizes of the sampled firms. These industry group averages are then weighted together according to the total number of employees in employment in each group, to produce grossed-up earnings for industry classes (roughly 2-digit ISIC), and ultimately for the whole economy. The employment weights used are held constant for long periods, being updated when the sample is refreshed.

2.7 The data supplied by establishments are "Earnings", that is what employees actually received before tax. They thus include:

- payments for overtime working
- bonus payments
- shift premiums
- grading increments
- other incentive and productivity payments

The **increase in earnings** is a comparison of the average earnings in a particular month with the average earnings for the same month in the previous year.

2.8 The UK employers federation (the Confederation of British Industries or CBI) collects and publishes data on pay from its members. These differ from the official statistics in that they are changes in pay rates, commonly called "Settlements".

Settlements are agreements made by employers:

- to increase pay by a certain percentage,
- to increase bonus and other payments,
- to reduce hours, or
- to reduce the number of increments on a pay scale.

Settlements are thus forward looking and have a strong bearing on increases in earnings over the next 12 months. Not all employers pay settlements at the same time hence average earnings for any month will cover some employees whose pay was increased a week before and some whose pay was increased a year before. For this reason, today's settlements take time to affect average earnings. The amount of **overtime and other payments** relative to basic pay can also change from one period to another. In particular, the extent of overtime and shift working, and the prevalence of some types of bonus pay (eg, profit-related bonuses), will vary with the state of the economy.

2.9 The settlements data collected by the CBI, and there are similar data collections conducted by private sector research bodies, are not fully representative and unbiased as they are supplied voluntarily from an unrepresentative panel. Settlements data are however a valuable economic indicator to use in conjunction with earnings data.

2.10 The precise effect of a settlement on average earnings will depend on the number of employees affected, the time taken to conclude negotiations and to award the new rates of pay, and the extent to which such awards are backdated. The payment of bonuses can also be erratic, and indeed earnings as a whole are subject to the short-term effects of seasonal factors, industrial disputes and even the timing of public holidays. Because the erratic nature of the index makes it difficult to monitor trends an

underlying rate of earnings growth is calculated. This adjusts for as many of the erratic factors as can be readily measured or estimated to give a clearer picture of short-term trends in earnings growth.

2.11 The Index uses constant employment weights for industry groups to eliminate the effect of changing employment numbers in these groups. Although the panel is used for a number of years the sample may become out of date due to firms closing down or changing in size, so that they should be in a different size band. This effects the accuracy of the index and so the panel must be up-dated regularly.

2.12 There is a balance to be struck in refreshing the sample. Too frequent up-dates would result in annoying discontinuities in the time-series, too infrequent would result in inaccuracies due to an out of date sample. Because we measure changes over a 12 month period we have to collect data on additions to the sample for 12 months before we can use their data. In the past we have up-dated every 4-5 years. In addition to bringing the sample back to the planned size this helps to share out the burden on small and medium sized firms. We are currently considering the introduction of rolling topping up of the sample. This is likely to involve the replacement of one-quarter of the sampled firms every year. Establishments with over 1000 employees are always in and we may consider keeping other, medium size firms in longer as they may gain little if they have to stop and start computing arrangements every other year or so.

2.13 Improvements due to regular up-dating depend on an accurate and up-to-date register. We have improved our register of businesses, by collaborating with the Central Statistical Office to produce a single register which we can both access. The cost of keeping it up-to-date are thus shared and together we are more likely to find out when firms close, merge, or open. The register contains an industry code and the size of the enterprise.

2.14 The survey runs quite smoothly because it has a well established monthly pattern and whenever possible the questionnaires are sent to named individuals. By asking for information which is readily available from payroll records we reduce the burden on establishments and ensure good co-operation, but there is a cost in terms of accuracy. The lack of detail prevents the elimination of structural change in the

composition of the workforce. At the moment we estimate the effect of composition changes annually using New Earnings Survey data, which does have occupation detail and which does separately identify full-time and part-time employees. This allows us to retrospectively assess the effect composition changes had on the monthly Average Earnings Index but not to adjust for them. In the longer term there is the possibility of introducing an Employment Cost Index similar to that of the US Bureau of Labour Statistics. Pilot work is in progress within the European Community (EC) introducing the ECI in all EC countries.

3. The New Earnings Survey

3.1 The New Earnings Survey (NES) is carried out in Great Britain by the Employment Department. A similar but separate survey is conducted by the Department of Economic Development in respect of employees in Northern Ireland. It is a survey of individuals' gross earnings, but the information is obtained from establishments' records rather than from the employees themselves. It is based on a one per cent random sample of employees in employment in all sectors of the economy (other than the Armed Forces), drawn largely from records of those who pay income tax. Each such employee has a 'National Insurance' number, and the sample is drawn simply by selecting those employees whose National Insurance number ends with two specified digits. The survey does not cover self-employed persons.

3.2 Because the information will be obtained from employers, the current employer of each individual in the sample has to be identified (the information is of course treated in strict confidence). This is done from lists provided either by the tax authorities or, for about one quarter of the sample, directly by some large employers who interrogate their pay records to locate the employees with the specified last two digits of their National Insurance number.

3.3 The **coverage** of the NES sample depends essentially on the coverage of the tax records. People earning below the income tax threshold do not generally have such records, and so the sample's coverage of people with very low weekly earnings - mostly part-time employees - is far from complete. In addition, the tax records are sure to be out of date to some extent, for example because of labour

turnover, which will reduce the achieved sample size. Both shortcomings are lessened if the sample is identified direct by employers without the use of tax records. These special arrangements are therefore being pursued to improve processing efficiency and also to help achieve the goal of the sample including all current employees in the organisation who have the requisite National Insurance numbers.

3.4 Employers are required by the 1947 Statistics of Trade Act to supply the information specified by the NES, and almost all the questionnaires issued are returned. However, mainly for the reasons described in the previous paragraph, the **response rate** calculated relative to the total number of employees in Great Britain (estimated from other sources) has always been lower than this. In recent years it has been a little over 80 per cent for full-time employees, and less than 70 per cent for part-timers. The total achieved sample size depends on the number of people in employment and the 1991 NES obtained data on 172,000 employees.

3.5 The data collected each year are of three types: earnings for the survey pay-period (normally a week or month, converted to a week for analysis); hours of work; and various classificatory information. **Total gross earnings** for the pay-period are collected divided into the following components (where applicable):

- (a) Overtime earnings
- (b) Payment by results and incentive payments (eg. piecework, bonuses)
- (c) Premium payments for shift work
- (d) Basic pay and all other payments.

Data on fringe benefits and payments in kind (except for workers in agriculture and catering), and employers' contributions to pension schemes etc., are **not** collected in the NES.

3.6 **Hours of work** are collected split between:

- (a) Basic [or if precise hours not known, whether full-time (>30 hours per week) or part-time]
- (b) Overtime.

As well as being of interest in their own right, these are used in the calculation of hourly

earnings and the definition of 'full-time' and 'part-time' employees.

3.7 Variables collected for use in the **classification** of individuals are:

- (a) Gender
- (b) Age
- (c) Occupation (including manual/non-manual split)
- (d) Industry
- (e) Area of place of work
- (f) Whether has worked in same job for one year or more
- (g) Whether affected by specified collective agreements
- (h) Whether covered by a statutory Wages Board/Council

- (i) Whether on adult rates of pay
- (j) Whether earnings for the pay-period were affected by absence.

An approximate breakdown between the public and private sectors of employment is derived from a combination of (d) and (g). Details of personal characteristics of the employees such as qualifications, race and disability are **not** collected by the NES - because they would be difficult to obtain from employers' payroll records.

3.8 The conduct of the NES is a very large operation, involving substantial clerical input as well as a complex batch-processing computer system (for data input and validation, and - since 1986 - production of tables as 'camera-ready copy'). The sample is obtained from the tax authorities on magnetic tape, and the questionnaires are produced addressed, and enveloped using computer assisted procedures. This was done for the first time in 1993. It is expected this will bring efficiency savings and better management information. The data quality should also improve as there will be more time to clear errors.

3.9 The first results of the NES are published within six months of the April survey period, and the full set of six volumes of detailed analyses follows by the end of the calendar year. This is very quick compared to other national surveys of its scale, though of course this timeliness does cost resources, and limits the time available for quality checks on the data. The data are currently disseminated on paper but it is planned

to make more use of microcomputer-based technology to disseminate the results.

3.10 To aid analysis, the results are normally presented separately for males and females, and for manual and non-manual employees. Most published results are confined to full-time employees on adult rates. Thus they do **not** include the earnings of those who did not work a full week, and those whose earnings were reduced because of sickness, short-time working, etc. Nor do they include the earnings of people not on adult rates of pay or part-time employees, for whom the NES has incomplete coverage because it is largely limited to people earning above the income tax threshold (see 3.2-3.3 above). There are some tables on the earnings of young people and part-time women but there is little reliable information on part-time men because the sample numbers are small.

3.11 Although the detailed data are very useful the single annual "snapshot" has the drawback that the information collected on earnings in the survey pay period may not be typical. Payments of arrears from another period made during the survey period are excluded, as are any payments due as a result of a pay settlement but not yet paid at the time of the survey. As a result the annual changes can be much larger or much smaller than expected and if so they should be examined to see if there were two, or no, settlements in the 12 month period.

3.12 Annual increases in average earnings are presented both by direct comparison of the results of two consecutive surveys, and by limiting the comparison to the **matched sample** of employees who appear in both years. The sample design, being based on the same National Insurance numbers each year (see para 3.1 above), ensures a high level of matching. It also permits the production of a longitudinal dataset linking NES data for individuals over all the years for which they appear in the sample.

3.13 This **Panel Dataset** now contains information for more than 400,000 individuals over the years 1975 to 1990. Many individuals appear in the Panel for only two or three years, but over half are present for at least five years, and some for the full sixteen year period. Work has started on linking the NES Panel Dataset to a dataset of individual unemployment histories, also based on National Insurance numbers. This should help to fill some of the gaps in the linked data (as well as providing a means of assessing

the relationship between unemployment and earnings).

3.14 In conducting the NES we must be conscious of the need to balance the requirements for detailed data with accuracy and timeliness, and with the requirement to minimise the burden on establishments. Largely to keep the form-filling burden on business to a minimum, the NES questionnaire is restricted in size to a single sheet of paper and the questions are generally unchanged from one year to the next. In the past, there have been occasional questions on subjects of special interest - for example size of organisation and holiday entitlement, and also (in 1979) a number of questions included to meet EUROSTAT's requirements for a "Structure of Earnings Survey". Such occasional questions have not been asked since 1988, to ease the burden on employers and especially to encourage them to develop systems to interrogate their payroll data to supply data in computer readable form. It is hoped that in the future 'trailer surveys' may permit greater flexibility in the issues covered without adding too much to the burden. The simple breakdown of the components of earnings used by the NES may no longer be sufficiently discriminating for the more complex payment systems that now exist. Recent research has suggested that it may be both desirable and feasible to revise the questionnaire, particularly in the area of incentive payments.

3.15 There is a process of continual improvement - to reduce costs and to improve value for money. Having automated the questionnaire production and dispatch we are now working on the following improvements: Trailer surveys to collect additional data from a sub-sample, software to code occupation, software to store and manage tables, optical character recognition data input and document image processing of forms, and we have to replace our tabulation software.

4. The Labour Costs Survey

4.1 Labour costs are the total cost to the employer of employing labour. In addition to gross earnings of the employees, this includes employers' contributions to the statutory and voluntary social security and pension schemes; benefits paid in kind to employees; and the costs borne by employers of training, welfare services, transport to and from work, and items such as special clothing.

4.2 The European Community (EC) Survey of Labour Costs is required to be carried out in all member states under a Community Regulation. The survey has been conducted at 4-yearly intervals in the recent past: 1984, 1988, and now 1992. The information collected is quite detailed and most EC countries use personal visits to establishments. We visited establishments for pilot work but have found we can use postal questionnaires to obtain the information. This reduces our costs and has proved to be acceptable to establishments.

4.3 The data collected are:

- wages and salaries (of all employees and of apprentices and trainees separately)
- employer's national insurance contributions
- redundancy payments
- vocational training expenditure
- liability insurance premiums
- pension and life insurance contributions
- sickness and injury fund payments
- contributions from central government
- number of employees and hours worked

Large employers are also asked for:

- periodical bonus payments
- payments for hours not worked (holidays, sickness, maternity leave, etc.)
- benefits in kind
- expenditure on housing and other subsidised services
- cost of recruiting staff
- cost of company cars

4.4 The sampling fractions used take account of the variability of the sectors. They range from 1/40 for small construction establishments. Establishments with fewer than 10 employees are excluded while all those with 500 or more are included. Banking and insurance firms were fully covered by approaching their trade federation.

4.5 Although the survey places a larger burden on businesses than the earnings surveys most establishments are co-operative. In 1988 10,700 forms were dispatched and, allowing for closures, mergers, etc a response rate of 83%

was achieved. The 1992 survey has been expanded to cover more service sector establishments and over 15,000 forms were dispatched.

4.6 One problem for establishments is that the questionnaire requests total costs for the whole year. We thus send a copy of the questionnaire near the start of the year to ensure that their information systems can collect the required data. The final questionnaire is sent in December for return by the following June.

4.7 We are obliged to review our statutory surveys every five years. As part of the recent review a sample of firms was asked if completing the questionnaire presented difficulties. Most could obtain the data from their computer records but some had problems in reporting the wages of trainees and the total hours worked by their employees. The average time required to complete the questionnaire was reported to be 3½ hours.

U.S. ESTABLISHMENT-BASED LOCALITY PAY SURVEYS

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BACKGROUND

On November 5, 1990, President George Bush signed into law the Federal Employees Pay Comparability Act of 1990 (FEPCA). The Act established a new pay setting process for Federal white-collar (General Schedule) employees that involved two Bureau of Labor Statistics (BLS) survey programs:

1. Uniform annual pay adjustments to Federal white-collar salaries, based on the BLS Employment Cost Index, minus .5 percentage point.
2. Locality pay comparability adjustments, based on BLS surveys of non-Federal employers.

This two-part approach to Federal pay comparability (see View Graph 1 in Appendix) is intended to keep the so called pay gap (between pay for Federal white-collar employees and their non-Federal counterparts) from widening, while gradually attaining Federal pay comparability in local labor markets over a 9-year period.

Major parties under FEPCA's new pay setting process (View Graph 2) include:

- The President of the United States who receives recommendations of his Pay Agent and decides on pay adjustments for Federal white-collar employees within limits of statutory discretions.
- The President's Pay Agent (currently the Secretary of Labor and the Directors of the Office of Management and Budget and the Office of Personnel Management) responsible for selecting and defining localities and occupations used in the pay comparability process, measuring pay disparities between Federal and non-Federal white-collar employees,

and recommending locality pay adjustments to the President.

- The Federal Salary Council (six representatives of Federal labor organizations and three outside pay experts) which advises the Pay Agent on the pay comparability process, e.g., selecting and defining localities, measuring Federal/non-Federal pay disparities, selecting occupations included in BLS locality pay surveys.
- The Bureau of Labor Statistics which conducts locality pay surveys of non-Federal employers and delivers results to the Pay Agent.

This paper focuses on the Pay Agent's initial request to BLS to conduct occupational pay surveys in 32 localities (View Graph 3) and the "Rest of United States," for use in the first (January 1994) FEPCA locality pay adjustments. The locality pay survey program was developed by: (1) Expanding the industrial coverage of BLS annual Area Wage Surveys to include all private nonfarm establishments (except households) employing 50 workers or more and to State and local governments; and (2) adding more professional, administrative, technical, and protective service occupations to the Area Wage Surveys.

The Detroit, Michigan locality pay survey for December 1991 (BLS Bulletin 3060-60) will supplement this paper by illustrating survey coverage, statistical design, survey estimates, and measures of reliability.

DESIGNING AND CONDUCTING LOCALITY PAY SURVEYS

Survey Objectives. A major objective of locality pay surveys is describing the level and distribution of occupational pay in a variety of the Nation's

local labor markets, using a consistent survey approach. (View Graph 4.) More specifically, the surveys are designed to provide estimates of straight-time rates of pay for incumbents in a wide variety of occupations and work levels in local labor markets.

Another survey objective calls for a high degree of reliability in terms of survey response, data collection, survey estimates, and sampling and nonsampling error. Survey reliability takes on particular importance under FEPCA because results will be used to set pay for about 1.5 million Federal white-collar employees. Moreover, a 1-percent increase in Federal white-collar salaries costs approximately \$500 million.

In addition to their FEPCA role, locality pay surveys are used in wage and salary administration by private industry employers and State and local governments, collective bargaining, determining business or plant location, and by the U.S. Department of Labor in making wage determinations under the Service Contract Act. Thus, BLS published reports on locality pay surveys serve a range of important users, including sample members (establishments) providing the survey data.

Survey Coverage. Coverage of locality pay surveys, to a large extent, was determined by the President's Pay Agent, addressing data needed to implement FEPCA. The Agent specified the occupations and localities to be surveyed, the geographic dimensions of the surveys, the industrial coverage, and the minimum employment size of establishments to be included in the surveys. BLS assisted the Agent with technical advice on survey coverage, based on its long experience in conducting occupational pay surveys.

Occupations surveyed for FEPCA included about 28 occupations spanning 113 work levels, including white-collar and protective service activities. (See View Graph 5.) The occupations ranged from clerks to high-level attorneys and engineers to corrections officers, firefighters, and police officers. Blue-collar occupations, not required by FEPCA, were included in the pay surveys to round out BLS published reports for local labor markets. (See View Graph 6.) Survey occupations are, for the most part, found in a variety of industries (i.e., "cross-industry"

occupations), rather than being unique to one or two industries.

The geographic coverage of locality pay surveys conform to Standard Metropolitan Statistical Areas, as defined by the U.S. Office of Management and Budget, through October 1984. Metropolitan Statistical Areas are typically made up of a central city with 50,000 population or more and surrounding counties that are socially and economically integrated with the central city. The Detroit metropolitan area, for example, includes the city of Detroit and Lapeer, Livingston, Macomb, Monroe, Oakland, St. Clair, and Wayne Counties, Michigan. (See View Graph 7.)

The industrial coverage of FEPCA locality pay surveys, as mentioned above, expanded the scope of BLS Area Wage Surveys to all private nonfarm industries (except households) and to State and local governments. (See View Graph 8.) The expanded coverage excludes private households, agriculture, the Federal Government, and the self-employed. Survey coverage is limited to establishments employing 50 workers or more. Smaller establishments are not expected to employ many workers in the narrowly defined occupations and work levels covered by the surveys.

Survey sampling frame and design. The list of establishments from which the survey sample was selected (the sampling frame) was developed from the State unemployment insurance reports for Metropolitan Statistical Areas. Establishments with 50 workers or more during the sampling frame's reference period were included in the survey sample even if they employed fewer than 50 workers at the time of the survey.

The sampling frame was reviewed for completeness and accuracy prior to the survey and, when necessary, corrections were made: Missing establishments were added; out-of-business and out-of-scope establishments were removed; and addresses, employment levels, industry classification, and other information were updated.

The survey design includes classifying individual establishments into groups (strata) based on industry and employment size, determining the size of the sample for each group (stratum), and selecting an establishment sample from each stratum. The strata used to select sample

establishments for the surveys were typically based on two-digit Standard Industrial Classifications (e.g., SIC 20 Food and Kindred Products, SIC 26 Paper and Allied Products), as defined by the U.S. Office of Management and Budget, and establishment employment size (e.g., 50-99 employees, 100-499 employees). (See View Graph 9.)

The establishment sample size in a stratum was determined by expected number of employees to be found (based on previous occupational pay surveys) in professional, administrative, technical, protective service, and clerical occupations. In other words, the larger the number of employees expected to be found in designated occupations, the larger the establishment sample in that stratum. An upward adjustment to the establishment sample size also was made in strata expected to have relatively high sampling error for certain occupations, based on previous survey experiences.

Each sample establishment was assigned a weight based on its probability of selection (e.g., a weight of 3 indicates that the establishment represents itself and others; a weight of 1 indicates it was selected with certainty, representing only itself).

Data Collection and Review. A major feature of locality pay surveys (and other BLS Occupational Pay Surveys) is personal visits by BLS field economists to sample establishments to gather information on pay of workers in the survey occupations. Personal-visit wage surveys continue a tradition established early in BLS history by Carroll D. Wright, the first BLS Commissioner. Wright felt strongly that the use of trained field representatives, rather than mail questionnaires, was required to ensure adequacy and quality of response in occupational wage surveys.

The most important activity of the BLS field economist during visits to sample establishments is "job matching," i.e., classifying establishment workers into survey occupations according to major pay determining duties and responsibilities--the survey occupational descriptions. "Job matching" relies on a dialogue between the BLS field economist and an establishment official familiar with the establishment's job structure and classification system. A simple example of a pay survey occupational description (View Graph 10) follows:

JANITOR, PORTER, OR CLEANER

Cleans and keeps in an orderly condition factory working areas and washrooms, or premises of an office, apartment house, or commercial or other establishment. Duties involve a combination of the following: Sweeping, mopping or scrubbing, and polishing floors; removing chips, trash, and other refuse; dusting equipment, furniture, or fixtures; polishing metal fixtures or trimming; providing supplies and minor maintenance service; and cleaning lavatories, showers, and restrooms. Workers who specialize in window washing are excluded.

Survey descriptions vary from the simple one above to highly complex, multi-work level descriptions for accountants, attorneys, and engineers. The engineer description, for example, includes eight work levels ranging from entry-level engineers (recent university graduates) to high-level project engineers responsible for large, complex, and expensive engineering programs.

Descriptions for the occupational work levels used in the FEPCA locality pay surveys relate to individual grades in the General Schedule (GS) for Federal white-collar employees. The link between survey work level description and GS grades is determined by the U.S. Office of Personnel Management. The eight survey work levels for engineers, for example, are linked to GS-5 (level I), GS-7 (level II), etc. (See View Graph 11.)

Once job matching is complete BLS field economists collect straight-time rates of pay (sometimes referred to as "transaction rates") for individual incumbents in the jobs or work levels. The pay data is gathered from establishment records, typically payrolls.

Pay data gathered by BLS field economists are reviewed and edited before they are certified "clean and on file." Data are reviewed by senior staff in BLS regional offices prior to entry in a computer system. Subsequently, computer system edits are produced for regional reviewers to uncover gross errors in the data (e.g., misplaced decimal points, impossible codes). A final edit is then produced to identify substantive errors (e.g., questionable pay relationships among and within

occupations). The substantive edit is carried out in BLS regional offices, with review by BLS staff in Washington, D.C., before data are declared "clean and on file," ready for estimation.

Survey Estimates. Preparing survey estimates involves assigning final survey weights and applying nonresponse adjustment factors, to adjust for nonresponse experience (refusals, out-of-business, etc.) during data collection. The final weights, which incorporate nonresponse factors, are used to aggregate survey data to estimate occupational pay levels and distributions that relate to survey's industry and establishment employment-size coverage within the metropolitan statistical area.

The survey estimates for occupations and work levels are illustrated below for "Level I Accountants in Detroit, Michigan in December 1991." (View Graph 12 and page 3 of BLS Bulletin 3060-60.)

Occupation	Accountants
Work level	I
Number of workers	403
Average weekly hours	39.8
Weekly earnings	
Mean	\$484
Median	480
First Quartile	432
Third Quartile	508
Percent of workers with weekly earnings of -	
Under \$350	*
\$350 and under \$400	3
400 and under 450	34
450 and under 500	27
500 and under 600	29
600 and under 700	5
700 and under 800	<u>1</u>
	100

* Less than 0.5 percent.

Once survey estimates are completed they are screened for confidentiality to insure that published materials will not disclose data for individual respondents cooperating in the surveys.

In return for voluntary cooperation in the surveys, BLS gives sample establishments a pledge to keep its identity and the data it provides in strict confidence. Prior to publication, survey estimates also are analyzed in light of survey response, relative standard error, and nonsampling error.

Reliability of Survey Estimates. The reliability of survey estimates is examined from several vantage points, as demonstrated below for the December 1991 Detroit, Michigan survey (View Graph 13 and BLS Bulletin 3060-60):

- o Percent of survey universe included in sample establishments (Page A-6)
 - Establishments (10% of 4,391)
 - Employment (50% of 1,229,958)
- o Survey nonresponse rates (Page A-2) for establishments (7.4%) and employment (7.4%)
- o Estimates of sampling error (Page A-2) on mean pay levels for occupations and work levels published

One relative standard error	Percent of published occupations and work levels
Under 1 percent	28.9
1 and under 3 percent	52.9
3 and under 5 percent	17.5
5 percent and over	0.7

- o Nonsampling error, "Job Match Validation" (Page A-3) An independent check by review staff with survey respondents indicates that, of 751 job matches checked, about 5 percent were changed.

The measures of reliability of survey estimates are made available to the President's Pay Agent, at the same time that survey results are delivered. The package of 32 locality pay surveys and the "Rest of United States" will be delivered to the Pay Agent on a flow basis, through August 31, 1993. This delivery schedule was established to accommodate January 1994 locality pay adjustments under the new Federal Employees Pay Comparability Act.

BLS

FEDERAL EMPLOYEES PAY COMPARABILITY ACT OF 1990, (FEPCA)

New Pay Adjustment Process for White-Collar Employees

1. Uniform nationwide pay adjustments, based on BLS Employment Cost Index (ECI) minus .5 percentage points.
2. Locality pay adjustments, based on BLS surveys of non-Federal employers, (establishmennts).

View Graph #1

BLS

PLAYERS IN NEW PAY ADJUSTMENT PROCESS

- ★ **President**
 - Receives his Pay Agent's recommendations and decides on pay adjustments for Federal white-collar employees.
- ★ **Pay Agent**
 - Identifies pay localities, pay disparities in localities, and recommends comparability adjustments to the President.
- ★ **Federal Salary Council**
 - Advises Pay Agent on new pay comparability process and adjustments.
- ★ **Bureau of Labor Statistics**
 - Conducts surveys of non-Federal employers and submits data to Pay Agents.

View Graph #2

BLS

BLS LOCALITY PAY SURVEYS

- | | |
|------------------------------|---|
| ★ ATLANTA, GA | ★ MEMPHIS, TN-AR-MS |
| ★ BALTIMORE, MD | ★ NASSAU-SUFFOLK, NY |
| ★ BOSTON, MA | ★ NEW YORK, NY |
| ★ CHICAGO, IL | ★ OKLAHOMA CITY, OK |
| ★ CINCINNATI, OH-KY-IN | ★ OAKLAND, CA |
| ★ CLEVELAND, OH | ★ NORFOLK-VIRGINIA BEACH-NEWPORT NEWS, VA |
| ★ DALLAS, TX | ★ PHILADELPHIA, PA-NJ |
| ★ DAYTON-SPRINGFIELD, OH | ★ RIVERSIDE-SAN BERNARDINO, CA |
| ★ DENVER, CO | ★ SACRAMENTO, CA |
| ★ DETROIT, MI | ★ SALT LAKE CITY-OGDEN, UT |
| ★ HOUSTON, TX | ★ SAN ANTONIO, TX |
| ★ HUNTSVILLE, AL | ★ SAN DIEGO, CA |
| ★ INDIANAPOLIS, IN | ★ SAN FRANCISCO, CA |
| ★ KANSAS CITY, MO-KS | ★ SEATTLE, WA |
| ★ LAWRENCE-HAVERHILL, MA-NH | ★ ST. LOUIS, MO-IL |
| ★ LOS ANGELES-LONG BEACH, CA | ★ WASHINGTON, DC-MD-VA |

★ "Rest of United States"

View Graph #3

BLS

MAJOR OBJECTIVES OF LOCALITY PAY SURVEYS

1. Describing the level and distribution of occupational pay in a variety of the nation's local labor markets, using a consistent survey approach.
2. Maintaining a high degree of reliability in terms of survey response, data collection, survey estimates, and sampling and non-sampling error.

[View Graph #4](#)

BLS

OCCUPATIONS SURVEYED FOR FEPCA

PROFESSIONAL OCCUPATIONS

- Accountants (6 levels)
- Accountants, public (4 levels)
- Attorneys (6 levels)
- Engineers (8 levels)

TECHNICAL OCCUPATIONS

- Computer operators (5 levels)
- Drafters (4 levels)
- Engineering technicians (6 levels)
- Engineers technicians, civil (6 levels)

PROTECTIVE SERVICE OCCUPATIONS

- Corrective officers(1 levels)
- Firefighters (1 level)
- Police officers, uniformed (2 levels)

ADMINISTRATIVE OCCUPATIONS

- Budget analysts (4 levels)
- Budget analysts, supervisory (2 levels)
- Buyer/contracting specialists (5 levels)
- Computer programmers (5 levels)
- Computer systems analysts (5 levels)
- Computer systems analysts supervisory/management (4levels)
- Personnel specialists (6 levels)
- Personnel supervisors/managers (5 levels)
- Tax collector (3 levels)

CLERICAL OCCUPATIONS

- Clerks, accounting (4 levels)
- Clerks, general (4 levels)
- Clerks, order (2 levels)
- Key entry operator (2 levels)
- Personnel assistants (4 levels)
- Secretaries (5 levels)
- Switchboard operator-receptionists (1 level)
- Word processor (3 levels)

[View Graph #5](#)

**NON-FEPCA
OCCUPATIONS**

MAINTENANCE AND POWER PLANT OCCUPATIONS

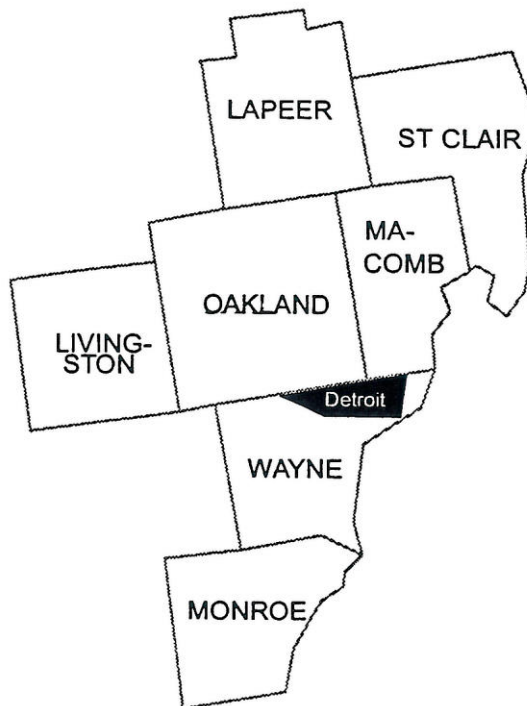
- General maintenance workers (1 level)
- Maintenance electricians (1 level)
- Maintenance electronics technicians (3 levels)
- Maintenance machinists (1 level)
- Maintenance mechanics, machinery (1 level)
- Maintenance mechanics, motor vehicle (1 level)
- Maintenance pipefitters (1 level)
- Tool and die makers (1 level)

CUSTODIAL AND MATERIAL MOVEMENT OCCUPATIONS

- Forklift operators (1 level)
- Guards (2 levels)
- Janitors (1 level)
- Material handling laborers (1 level)
- Order fillers (1 level)
- Shipping and receiving clerks (1 level)
- Truckdrivers (4 levels)
- Warehouse specialists (1 level)

View Graph #6

**DETROIT, MICHIGAN.
METROPOLITAN STATISTICAL AREA**



View Graph #7

BLS

**INDUSTRIAL COVERAGE OF LOCALITY
PAY SURVEYS**

GOODS-PRODUCING INDUSTRIES

- Mining
- Construction
- Manufacturing

SERVICE-PRODUCING INDUSTRIES

- Transportation and public utilities
- Wholesale trade
- Retail trade
- Finance, insurance, and real estate
- Services
 - Personal
 - Business
 - Health
 - Education

STATE AND LOCAL GOVERNMENTS

NOTE: Establishment employment size of 50 workers or more.

View Graph #8

Sampling Matrix for Locality Pay Surveys

SIC	Industry	Total Employment	Number of establishments employing					
			Total	50-99 Workers	100-499 Workers	500-999 Workers	1000-2499 Workers	2500 Workers or more
20	Food and Kindred Products	30,000	40	15	10	8	4	3
21	Tobacco Products	2,800	10	4	3	3	-	-
↓								
80	Health Services	80,000	160	60	40	30	20	10
806	Hospitals	35,000	35	-	3	19	8	5

View Graph #9

SAMPLE OCCUPATIONAL DESCRIPTIONS

JANITOR, PORTER, and CLEANER

Cleans and keeps in an orderly condition factory working areas and washrooms, or premises of an office apartment house, or commercial or other building. Duties involve a combination of the following: sweeping, mopping, scrubbing, or polishing floors; removing chips, trash, and other refuse; dusting equipment, furniture, and fixtures; polishing metal fixtures and trimming; providing supplies and minor maintenance services; and cleaning lavatories and showers.

Workers who specialize in window washing are excluded.

View Graph #10a

SAMPLE OCCUPATIONAL DESCRIPTIONS

FILE CLERK - (LEVELS)

Files, classifies, and retrieves material in an established filing system.

May perform clerical and manual tasks required to maintain files.

Positions are classified by level based on the following definitions:

Level 1. Performs routine filing of materials that has already been classified or which is easily classified in a simple classification system (e.g. alphabetical, chronological, or numerical).

Level II. Sorts, codes, and files unclassified material by subject matter headings or partly classified materials by finer subheadings.

View Graph #10b

BLS

ENGINEER WORK LEVELS SURVEYED

SURVEY WORK LEVEL	GENERAL SCHEDULE GRADE LEVEL
I	5
II	7
III	9
IV	11
V	12
VI	13
VII	14
VIII	15

View Graph #11



EXAMPLE OF LOCALITY PAY SURVEY ESTIMATES DETROIT, MICHIGAN, DECEMBER 1991

Occupation	Accountants
Work Level	I
Number of workers	403
Average weekly hours	39.8
Weekly earnings:	
Mean	\$484
Median	480
First Quartile	432
Third Quartile	508
Percent of workers with weekly earnings of	
Under \$350	*
\$350 and under \$400	3
400 and under 450	34
450 and under 500	27
500 and under 600	29
600 and under 700	5
700 and under 800	1

* Less than 0.5 percent.

View Graph #12



RELIABILITY OF LOCALITY PAY SURVEY ESTIMATES DETROIT, MICHIGAN, DECEMBER 1991

- ★ Percent of survey universe accounted for by sample establishments (Page A-6)
 - Establishments (10% of 4,391)
 - Employment (50% of 1,229,958)
- ★ Survey nonresponse rates (Page A-2) for establishments (7.4%) and employment (7.4%)
- ★ Estimated sampling error (Page A-2) on mean pay levels for occupations and work levels published

One relative standard error	Percent of published occupations and work levels
Under 1 percent	28.9
1 and under 3 percent	52.9
3 and under 5 percent	17.5
5 percent and over	0.7
- ★ Nonsampling error, "Job Match Validation" (Page A-3)

An independent check by survey staff with survey respondents indicates that of the 751 job matches checked, about 5 percent were changed.

View Graph #13

DISCUSSION

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These are all very informative papers on labor income surveys. As they demonstrate, there are many ways to collect information on labor income and many purposes to which such data are put. I will focus my remarks on data needs for understanding the labor market. Orchard and Stibbard describe various surveys done in the U. K., and I will begin by briefly summarizing selected other BLS surveys that provide information on labor income in addition to the locality pay surveys discussed by George Stelluto. I will then turn to some general themes concerning these papers and labor market data needs more generally, namely the target population, microdata, and linked household-establishment surveys.

BLS Labor Income Surveys

The Current Employment Statistics (CES) survey is the establishment survey which provides current monthly data on employment of all employees and of women and production or nonsupervisory workers separately. (This is the BLS survey that seems most similar to the U.K.'s Survey of Wages and Salaries.) Data on payrolls and hours are also collected for production and nonsupervisory workers and are used to construct an average hourly earnings (AHE) measure. CES data are available for many 2-, 3-, and 4-digit SICs separately.

The ES-202 is a cooperative endeavor of BLS and the state employment security agencies. Using quarterly data received about 5 months after the close of the quarter, BLS summarizes employment and wage data for workers covered by Unemployment Insurance laws, which is almost all workers, for virtually all 4-digit SICs. It provides no hours data, so an AHE type measure is not available. This source is used to benchmark the employment survey.

The Employment Cost Index (ECI) measures the rate of change in employee compensation, which includes wages, salaries, and employers' cost for employee benefits. The ECI, which is a fixed-weight, Laspeyres index of the change in the price of labor, provides an important picture of compensation changes which eliminates the effects of employment shifts among industries and occupations. Orchard and Stibbard note that pilot work is underway in the U.K. to develop such a survey. This seems important because the ECI series is preferable to the AHE-type measure for many purposes. Also, the ECI is more

comprehensive in terms of benefit costs than are other U.S. series.

For many types of economic analyses, household survey data are used in the U.S. The Current Population Survey (CPS) is a monthly survey of about 60,000 households from which the official monthly unemployment rate is calculated. Because the unemployment rate refers to people who are looking for work and are available for work, it is only possible to construct it using household data. Tabulations of labor force status for various demographic groups are also regularly calculated using the CPS, and in the U.S., where virtually no demographic information is available from establishment surveys, this is critically important. There has been a great deal of attention in the U.S. over the last several years to the issues of increasing wage dispersion, and the characteristics of people in various groups; these analyses primarily use the CPS data.

The National Longitudinal Surveys of Labor Market Experience (NLS) provide annual data over a long period of time for the same individuals in selected cohorts of the population. These permit analyzing issues that cannot be explored with cross-sectional or short-term longitudinal surveys, such as the impact of training on wages, the impact of youth unemployment on later labor market success, and so forth.

Microdata

Orchard and Stibbard point out the demands of users for more timely and detailed data. Another important need is greater access to microdata, a topic on which there was an earlier session here at ICES. In a 1986 article, Frank Stafford mentioned the volume of work that has been done on labor supply issues, which is not surprising in view of the rich household data sources that exist in the U.S., i.e. the CPS, the NLS, and the Michigan Panel Study of Income Dynamics (PSID). In contrast, there has been little microdata research using establishment surveys, largely because of confidentiality restrictions and also because such data have not typically been kept in the appropriate form for use within the statistical agencies. In a session yesterday, Bob McGuckin detailed the Census Bureau's efforts along these lines. Outside researchers have been able to access confidential microdata while serving as an ASA/NSF Fellow at either the Census Bureau or BLS. Considerable thought is being given now at BLS

to how to make the data more accessible while preserving confidentiality. Microdata from the rich data sources detailed by Orchard and Stibbard and by Hostrup-Pedersen would be extremely valuable for research purposes.

Target Population

It is interesting that in the U.K. as well as the U.S. early collection of data focused on certain types of workers--"manual" workers in the U.K. and production workers in the U.S. Perhaps this was true in most countries. But many establishment surveys still do not provide complete coverage of workers. The usual exceptions are the self-employed and workers in small firms. This latter omission, as noted by Orchard and Stibbard, affects different sectors of the economy differently; notably, certain services industries will be greatly underrepresented. For understanding the labor market situation, it is critical to have at least some data that cover all of these workers.

In the U.S., major policy issues concern things like whether real earnings are declining and what is happening to low-paid workers relative to the more highly paid. It is important to have complete coverage to satisfactorily address these questions, to make comparisons of wages across industries, and so forth..

The U.K. Survey of Wages and Salaries and the Labor Cost Survey have these coverage limitations, as do the U.S. establishment surveys. The U.K. New Earnings Survey also does not cover the self-employed, but more importantly it does not cover persons below a certain income tax threshold and will underrepresent those types of workers with higher job turnover, as Orchard and Stibbard imply. Thus, the effort they note to make the sample cover all employees is a very important one. The register-based approach described by Hostrup-Pederson would not have this limitation. Also, household surveys do not have it (although there may be other coverage problems and/or data quality concerns.)

Having a matched panel data set from the New Earnings Survey should support many interesting analyses. However, again, a survey such as The New Earnings Survey has a key limitation for many purposes, since it is a selected sample.

Linked household/establishment surveys

Linked household and establishment surveys, which have rarely been done in the U.S., and to my knowledge are not done by the U.S. statistical agencies on an ongoing basis, could provide extremely rich information for labor market analysis.

Both the Orchard and Stibbard and the Hostrup-Pedersen papers describe establishment data sets that provide some information on persons. The need for merged establishment-household data is important not only for microdata research needs. As is widely recognized, some information can be collected more accurately from establishment surveys--for instance, the industry and occupation (type of work) of the job. But in the U.S., if we want to know anything about the human capital or the demographic characteristics of workers in an industry or occupation, we must turn to household surveys. If some information is available only on household surveys and other information is available on establishment surveys, one can bring it together based on tabulations of data from the two sources--i.e. one could use data on earnings in an industry from an establishment survey and data on the educational attainment of workers in that industry from a household survey, but since the industry variables are measured differently such matches are less than ideal.

Some kinds of information we may want for household-based analyses cannot be obtained directly from households. For instance, information on the amount of fringe benefits paid for particular individuals together with information on the household demographics and income sources is not available in the U.S. and would only be possible with a linked household/establishment survey. This is particularly important for the U.S. since health insurance is provided by private employers and also employer-provided pension benefits are so important.

Hostrup-Pedersen describes the use of register-based data. The U.S. does not have such a register of persons that is used in this way. What this register provides to Danmarks Statistik is a straightforward method for obtaining linked employer/employee information with a frame that should be of extremely high quality. But as the Orchard/Stibbard paper shows, it is not necessary to have such an individual register to get this information--it can be obtained by beginning with any administrative data set or sample frame providing information on persons.

REFERENCE

Stafford, Frank, "Forestalling the Demise of Empirical Economics: The Role of Microdata in Labor Economics Research." In Orley C. Ashenfelter and Richard Layard (eds.), *Handbook of Labor Economics*, Vol. 1. New York: American Elsevier, 1986), pp. 387-423.