

WORKING PAPER 529

THE USE OF ESTABLISHMENT DATA TO EXAMINE EMPLOYMENT STRUCTURE:
TWO STUDIES IN WEST YORKSHIRE

Jill Aubrey, Graham Clarke and John Stillwell

School of Geography
University of Leeds
Leeds LS2 9JT

June, 1989

CONTENTS

Abstract

List of tables

List of figures

1. Introduction

2. Establishment data sources

2.1 Factory Inspectorate Records

2.2 Dun and Bradstreet Market Facts Files

2.3 Market Location Limited directories

2.4 Kompass trade directory

2.5 Business Statistics Office classified list of manufacturing businesses

2.6 Yorkshire and Humberside Development Association directories

2.7 Telephone directories

3. Establishment databanks

3.1 Databank 1: Establishments manufacturing food and soft drinks in West Yorkshire

3.2 Databank 2: Establishments in Leeds Metropolitan District employing more than 150 persons

4. The validity of data on establishments from alternative sources

4.1 Coverage and consistency

4.2 Food and soft drinks establishments

4.3 Large firms

5. The use of establishment data to examine employment structure

5.1 The food and soft drinks industry in West Yorkshire

5.2 Large firms in Leeds

6. Conclusions

References

Abstract

Two separate establishment databanks have been constructed independently to examine local employment structures. The first contains information on establishments in the food and soft drinks manufacturing industry in the county of West Yorkshire. The second contains data on firms located in the Leeds Metropolitan District who employ over 150 persons. In the paper, the sources from which data on the two sets of establishments has been extracted are reviewed and problems associated with coverage, accuracy and consistency of information in the two databanks are assessed. Some empirical results are presented to illustrate the structural and spatial characteristics of those establishments involved in food and soft drinks manufacture in West Yorkshire and of the biggest firms in Leeds.

List of Tables

1. Establishments in the food and soft drinks manufacturing industry in West Yorkshire recorded in different data sources
2. Employment size categories used for MLL, YHDA and BSO data
3. The availability and consistency of information obtained from establishment data sources on employment in the food industry
4. Large establishments (where >150 persons are employed) in Leeds recorded in different data sources
5. The consistency of information on large establishments in Leeds
6. The availability and consistency of large establishment employment data for University ward
7. Food and soft drinks manufacturing establishments in West Yorkshire and the UK by employment size category
8. Establishments in the food and soft drinks industry in West Yorkshire by MLH and employment size
9. Establishments in the food and soft drinks industry in West Yorkshire by employment size and status
10. The spatial distribution of food and soft drinks establishments in West Yorkshire by employment size
11. Size classification of large firms in Leeds
12. Large establishments in Leeds by MLH and employment size
13. Status of large firms in Leeds by employment size

List of Figures

1. Spatial distribution of food and soft drinks manufacturing establishments in West Yorkshire by employment size category
2. Spatial distribution of large firms in Leeds by ward

1. Introduction

There is no doubt that Britain's industrial structure has undergone a remarkable transformation over the past decade and a half. Structural and spatial patterns of employment change within and between different regions of the country have been identified from empirical research (see Fothergill and Gudgin 1982, for example) and new theoretical insights into the processes of development have been formulated (see Massey 1984, for example). At a local level, much of the more recent analysis of employment change within West Yorkshire (Palmer 1986a, 1986b; Clarke, Crewe and Leigh 1989a, 1989b) has been undertaken using workplace-based information from the Annual Census of Employment (ACE), now available from NOMIS, the National Online Manpower Information System, at a wide variety of spatial scales. Although confidentiality restrictions have prevented establishment level returns from being used directly, data by Amalgamated Office Area (AOA) or postal district can be utilized provided no individual firm can be recognized from results published.

The problems of confidentiality associated with ACE data, together with additional complications involved in the analysis of change between census dates due to alterations to the Standard Industrial Classification (SIC), sampling methods, and the boundaries of the spatial units defined, have placed increasing emphasis on the need to identify alternative sources of information. This has been a national trend and has resulted in much greater utilization of establishment-specific data sources as well as the construction of establishment-specific databanks in which information from various sources that are locality or

sector-specific, has been assembled. Micro-level information has particular advantages in terms of providing much greater detail about the processes of expansion or rationalization that have occurred within individual firms or plants (Lloyd and Shutt 1985, Healey and Clark 1985). Furthermore, the ability to aggregate establishment information to whatever scale is required presents the opportunity for more detailed analysis of the complex patterns which are evident at the region scale from studies based on data from the Annual Census of Employment (Massey and Meegan 1982, Morgan and Sayer 1985).

The aim of this paper is to describe some of the characteristics and limitations of data from various establishment data sources that have been assembled in two databanks constructed independently but simultaneously in the course of our research on patterns of employment change in West Yorkshire. The first of these databanks contains information on establishments in the food and soft drinks manufacturing sector in West Yorkshire. The second contains information on firms located in the Leeds Metropolitan District that employ more than 150 persons. Thus, the former databank provides information on establishments of all sizes within one sector of the economy, whereas the latter contains data on relatively large establishments across all industrial sectors that are located within a smaller geographical area. The paper is organized as follows: Section 2 contains a brief review of existing establishment data sources, and Section 3 outlines the data sets contained in each of the databanks. Data from alternative sources are compared and problems of reconciling inconsistencies are

discussed in Section 4. Finally, the employment characteristics of the food industry in West Yorkshire and of large firms in Leeds are presented in Section 5, and some conclusions are drawn in Section 6.

2. Establishment data sources

The use of establishment data sources has now become widespread and their characteristics and limitations have been well documented in the literature (Healey 1983, Thompson 1983, Foley 1983), although there are relatively few studies which describe the problems associated with amalgamating data from different sources. Given the inaccessibility of Census of Employment establishment records to the independent academic research community, there are three main national sources of data on employment by establishment. These are the Factory Inspectorate Records, Dun and Bradstreet UK Market Facts Files, and Market Location Limited directories. Each of these sources provides information on employment at establishments classified by location (address or postcode). Working in collaboration with a local authority, Foley (1983) has compared data from these sources with Census of Employment records for establishments in the electrical engineering industry in West Yorkshire, and demonstrated the inability of each source to provide a comprehensive list of the establishments concerned. Since one of the prime objectives in constructing each of the two databanks reported in this paper was to produce a comprehensive list of relevant establishments (for subsequent use in the case of the food industry as a sampling frame for further analysis), it was decided to explore the use of additional data sources including the Kompass trade directory, the Business Statistics Office classified list of manufacturing businesses and the telephone directory. The following sections briefly summarize the information available from each of the

sources.

2.1 Factory Inspectorate Records

Inspectors, working under the auspices of the Health and Safety Executive (HSE), are required to visit industrial establishments throughout the country for the purpose of checking factory health and safety standards. In the course of their duties, factory inspectors collect data on industrial activity types and numbers of employees at each establishment they visit. This data therefore provides an important source of employment information and has been the cornerstone of several establishment databases. Detailed work using Factory Inspectorate Records (FIR) has been undertaken, for example by the North West Industrial Research Unit at Manchester University (Lloyd and Mason 1978, Dicken and Lloyd 1978). Although there is some variation in FIR data according to location, the following information is generally available:

- (1) name and address of establishment;
- (2) establishment activity type by SIC order or MLH;
- (3) date of establishment opening; and
- (4) number of employees at establishment.

The information is rather limited, but the FIR provide a particularly useful source from which to identify small firm openings, particularly those concerned with public administration services. In theory, the FIR should contain a complete account of all factory openings and employment therein because firms are required by law to notify the HSE one month prior to when production commences at a particular establishment. In practise,

coverage is less than perfect and inspectors often have to rely on ad hoc methods of discovering new premises. Furthermore, inspections are carried out, on average, once in every three to four years which means that some of the FIR may be up to four years out of date. This is likely to be the case with the 1986 FIR relating to West Yorkshire which was obtained from Leeds City Council.

2.2 Dun and Bradstreet UK Market Facts Files

Dun and Bradstreet is a commercial company involved in providing customers with information about other companies. Data collected from surveys of local areas or sectors is collated into UK Market Facts Files which contain information on companies rather than establishments. The source is therefore an enterprise database rather than an establishment database, as one case may relate to a small family firm with one production establishment or a (multi)national company with several branches. The amount of information available from the Market Facts Files varies from company to company depending on the information requested by the commissioning organization. The 1985 files compiled by Dun and Bradstreet include the following information:

- (1) legal company name, address (including postcode) and telephone number;
- (2) dates of company formation and/or incorporation;
- (3) company activity based on 1968 SIC;
- (4) actual or estimated total employment;
- (5) actual or estimated annual turnover;

- (6) actual or estimated annual profits;
- (7) company type (eg. public, private, partnership)
- (8) corporate structure including:
 - (i) establishment/enterprise type status
(single location, headquarters, branch),
 - (ii) ultimate parent company if subsidiary;
- (9) nominal and issued share capital;
- (10) details of bankers; and
- (11) company credit rating.

The Dun and Bradstreet data sets are regularly recompiled. The company maintains an ongoing survey and a system of updating. However, the data contained in the files does not necessarily refer to the year of compilation, but to the date when the most recent set of information on each company was obtained. The 1985 Dun and Bradstreet data file for West Yorkshire, purchased for use by the School of Geography, contained information on 11700 establishments in total. Extensive use of Dun and Bradstreet files has been made by the University of Newcastle to monitor firm openings, survival rates and closures over time (Gallagher and Stewart 1986, Gallagher and Doyle 1986).

2.3 Market Location Limited directories

Market Location Limited (MLL) is a private company providing market research information on the location of industrial establishments. Data has been collected through area surveys, on-site interviews, and follow-up telephone interviews. Some local authorities now provide MLL with information on the

whereabouts of new establishments. The MLL directories usually contain the following information about individual establishments:

- (1) name, address, postcode and name of contact;
- (2) SIC category and activity of establishment;
- (3) number employed at establishment by size group and sex;
- (4) establishment status (head office or branch; independent or subsidiary).

The dates at which establishments were surveyed varies because of the continuous nature of the survey process. MLL stipulate that the information published in 1983 which has been used in this paper was based on 6 years of nationwide fieldwork. The London Industry and Employment Research Group (LIERG) has utilized MLL directories for 5 London boroughs, supplemented by information from local land use surveys, Yellow Pages directories, and a list of paypoints used for the Census of Employment (LIERG 1982, North et al 1983).

2.4 Kompass trade directory

Kompass also contains area-specific company information. However, some companies have to pay for their inclusion in the directory, as it is used primarily as a means of advertising. Although coverage is therefore significantly restricted, the information available from the directory is as follows:

- (1) company name, address, postcode and telephone number;
- (2) SIC group into which company products have been classified;
- (3) number of employees (if the company is part of a larger

organization, employment refers to the whole group);

(4) turnover; and

(5) names of directors.

The Kompas directory is normally available in local commercial libraries and that published in 1985 contains information relating to approximately 1700 companies in West Yorkshire.

2.5 Business Statistics Office classified list of manufacturing businesses

The 1984 classified list of manufacturing businesses created by the Business Statistics Office (BSO) contains the names and addresses of a sample of the businesses surveyed in the Censuses of Production conducted between 1978 and 1982, and reflects the contents of the register at mid-1984. Businesses are classified according to the 1980 SIC and data is published for each county. Only those establishments employing more than 20 people that consented to their name and address being published, are included on the list.

2.6 Yorkshire and Humberside Development Association directories

The Yorkshire and Humberside Development Association (YHDA) has compiled a directory of manufacturing companies which contains information as follows:

- (1) company name, address, postcode and telephone number;
- (2) named executive;
- (3) type of business (public, private, partnership);

- (4) parent company ownership;
- (5) description of products manufactured;
- (6) turnover size code; and
- (7) employment size code.

2.7 Telephone directories

The Yellow Pages directory is a useful source of up-to-date information of firms operating in particular sectors but no details of firms beyond name and address are available.

3 Establishment databanks

3.1 Databank 1: Establishments manufacturing food and soft drinks in West Yorkshire

The construction of a databank containing information from various sources on those establishments constituting the food and soft drinks manufacturing industry in the county of West Yorkshire was undertaken as part of a research project to examine the employment characteristics of firms in this particular sector and to explain the processes causing changes in the level and structures of employment in recent years (Aubrey 1988). It was necessary to create a comprehensive list of the firms concerned and to gather as much information as possible from existing sources to allow an overall assessment of the size and nature of the industry in West Yorkshire to be made. The list of firms subsequently provided a sampling frame from which to collect more detailed information on employment and on factors responsible for the changes in employment observed at selected establishments. Interviews were conducted with a relatively small sample of firms in an investigation of the employment implications of merger and takeover activity and of company expansion, diversification or rationalization in the face of changing product demand, supply competition and process automation.

The food and soft drinks databank contained data on employment from 5 sources:

- (1) Factory Inspectorate Records, compiled in 1986;
- (2) Dun and Bradstreet Market Facts Files, compiled in 1985;

- (3) Market Location Limited directories, compiled in 1983;
- (4) Kompas trade directory, published in 1985; and
- (5) YHDA Company Guide, published in 1981.

Two further sources were used to identify additional establishments and to check the existence of those already identified, although neither contained information on employment. The first was the BSO list of manufacturing businesses, published in 1984, and the second was the telephone (and Yellow Pages) directory published in 1985. Each of these sources provided data which was location-specific and which therefore enabled establishments in West Yorkshire to be identified. However, the date on which data from each of these sources was actually obtained from the establishments involved, varied between sources and between the establishments listed in any one of the sources.

3.2 Databank 2: Establishments with over 150 employees in Leeds Metropolitan District

The second establishment databank has been constructed as part of an ongoing research project to examine the structure of employment in industrial establishments contained within Leeds Metropolitan District (see Clarke, Crewe and Leigh 1989b). In this case, however, consideration has been focused on firms employing over 150 persons. Although these firms represent a minority of the establishments operating within the district, their role as major employers means that changes in their structure can have significant effects on levels of local unemployment. The databank

draws on information from the first four sources listed in the previous section, and the dates to which each of the sources refers are the same as those used in the case of the food industry. Additional data has also been obtained from company reports.

4. The validity of data by establishment from alternative sources

4.1 Coverage and consistency

When undertaking empirical research it is essential to recognize and understand the limitations of the data on which results are based. Appraisal of the data contained in both the food industry and the large firms databanks is, however, complicated by the fact that, a priori, one cannot expect the company data from one source to be superior to that from another. An important contribution of studies which utilize several establishment data sources is therefore to provide insights into the advantages and shortcomings of alternative data sets, in order to answer the following types of question: firstly, "what percentage of firms actually operating within a region are recorded in any one of the establishment data sources?"; secondly, "how accurate is the available information on each recorded establishment from any one source?"; and thirdly, "how consistent is the information available from more than one data source on any individual establishment?".

These types of questions have been addressed in previous studies, but typically for only one industrial sector. Foley (1983) for example, compared Dun and Bradstreet data (1979) with Market Location Limited data (1978), FIR (1979) and Census of Employment listings (1977) for establishments in the electrical engineering industry in West Yorkshire. The coverage of establishments was checked by telephoning firms listed in this category and asking them questions about products they manufactured. Foley's results

indicated that the percentages of establishments correctly identified by different sources varied between 50% and 60%. In a more recent survey, Gallagher and Stewart (1986) compared the establishments coded by the 1968 SIC which were identified in the Dun and Bradstreet files in 1981 with establishments covered in the 1979 Census of Production. Dun and Bradstreet data was found to account for only 43% of the establishments identified in the Census of Production as involved in food and drink manufacture. Gallagher and Stewart also compared employment data from Dun and Bradstreet with the results of a questionnaire survey they conducted. They found agreement on employment figures in 90% of cases, and consequently, concluded that although coverage by Dun and Bradstreet is limited, the accuracy of the information collected is reasonable. Gallagher and Doyle have gone as far as to say that Dun and Bradstreet employment data is as good as that they obtained using a specially designed questionnaire (Gallagher and Doyle 1986, p46).

In the following two sections, more detailed characteristics and limitations of the respective data sets used in each of the two establishment databanks are considered.

4.2 Food and soft drinks establishments

The total number of food and soft drinks establishments in West Yorkshire was determined by cross-referencing the establishments identified in each of the data sources referred to in section 3.1, and then checking their occurrence in the telephone and Yellow Pages directories. This resulted in the identification

of 315 different establishments, of which 247 were recorded in one or more of the sources indicated in Table 1. FIR provided the most comprehensive coverage of firms in this industry by including 60% of all the firms listed in the databank, of which 93% were also listed in the telephone directory. The Dun and Bradstreet data had the better coverage of the commercial data sources, identifying 57% of establishments in comparison with 45% covered by MLL and only 6% by Kompas. However, only 75% of the firms from the Dun and Bradstreet data were also listed in the telephone directory. The remaining sources, the YHDA company guide and the BSO listing of businesses, contained 46% and 26% respectively of the total of 247 establishments.

It became necessary to revise the number of establishments in existence following the completion of a postal questionnaire survey of the original 315 establishments which was undertaken in order to obtain information on establishments for which no employment data was available from other sources, and to check the accuracy of the employment data that had been already obtained. Unfortunately, the response rate to the questionnaire was poor with only 63 establishments providing further employment data, 48 of which had already been identified by one of the non-telephone directory sources. 15 questionnaires were returned to the Post Office because the companies concerned had vacated premises at the addresses recorded, and hence the number of establishments in existence in the database was revised to 300. The response to the questionnaire limited the extent to which the accuracy of the data contained in the databank from any one of the sources could be

Table 1: Establishments in the food and soft drinks manufacturing industry in West Yorkshire recorded in different data sources

Data source	Number of establishments recorded	% listed in telephone directory	% of all establishments (sources 1-6)
1. Factory Inspectorate Records (FIR)	147	93	60
2. Dun and Bradstreet Facts Files (D+B)	142	75	57
3. YHDA Company Guide (YHDA)	113	80	46
4. Market Location Ltd directories (MLL)	111	83	45
5. Business Stats Office listings (BSO)	65	85	26
6. Kompass directory (KOM)	16	88	6
Total recorded in sources listed	247		100

directly checked. An alternative method of checking, namely by comparing the information about a particular establishment contained in different data sets, was also complicated by the adoption of different definitions of employment categories. The FIR provides data on the absolute number of employees by establishment whereas Dun and Bradstreet data refers to total employment in each enterprise. MLL employment statistics are available by sex for each establishment classified on the basis of size, although slightly different employment size categories are used by the YHDA and the BSO (Table 2). In fact, only two establishments were recorded as having 1-25 employees by MLL and 20-49 employees by the YHDA. Since YHDA categories were adopted in the study, both these establishments were assigned to the 20-49 group. Employment information was available for 226 of the 300 establishments in existence in the databank. An analysis of the consistency with which employment details were recorded in the different data sets was undertaken for the 226 establishments. In 119 cases, only one source of employment information was available, and in 70 cases, employment data from more than one source proved to be consistent between sources. In the remaining 37 cases, however, inconsistency in the employment figures between sources occurred. Three groups of establishments with inconsistent data were identified:

- (1) 10 establishments where data from the questionnaire survey was inconsistent with data from one other source;

- (2) 6 establishments where data from the questionnaire was

Table 2: Employment size categories used for MLL, YHDA and BSO data

MLL Category	YHDA/BSO Category
1 - 10	1 - 19
11 - 25	20 - 49
26 - 50	50 - 99
51 - 100	100 - 449
101 - 250	500 - 999
251 - 500	
501 - 1000	
1001+	1000+

inconsistent with data from more than one other source; and

(3) 21 establishments where data from the non-questionnaire sources was inconsistent.

The problem of classification of establishments in the first two groups was solved by assuming that the questionnaire response was more likely to be correct. Establishments in the final group were classified in one of two ways. Firstly, when an establishment was recorded in the same size category by two or more data sources, this category was adopted. Secondly, absolute figures on employment were accepted in preference to categorized information. A summary of the availability and accuracy of the employment information obtained from the data sources is presented in Table 3. Not only does the FIR data set give superior coverage, but data on employment is also available for 92% of the establishments that it registers. Dun and Bradstreet data is poor in this respect because no employment data is available for over half the food and soft drink manufacturing establishments in the West Yorkshire data set. On the other hand, when the number of establishments with employment data consistent between sources is expressed as a percentage of the total number of establishments for which data is available from more than one source, Dun and Bradstreet data comes out on top with 73% compared with FIR data with 68%.

4.3 Large firms

In the study of the largest firms in Leeds, 230 establishments each employing over 150 persons were recorded by the

Table 3: The availability and consistency of information
obtained from establishment data sources on employment
in the food industry

	FIR	D+B	MLL	YHDA	KOM
Number of establishments in existence recorded	147	140	107	113	16
Number of establishments with employment data	135	68	71	56	12
% of establishments with employment data	92%	49%	66%	50%	75%
Number of establishments with employment data available from >1 source *	74	52	51	50	11
Number of establishments with employment data consistent between sources *	50	38	31	31	6
% of establishments with employment data consistent between sources *	68%	73%	61%	62%	55%

* Sources include questionnaire

four data sets investigated. It is apparent from Table 4 that FIR and Dun and Bradstreet data are superior in terms of coverage, both listing nearly 80% of the total number of establishments identified. It is also evident that the figures suggest a higher representation of firms in all the sources than was the case with firms in food and soft drinks manufacture (Table 1). This is not surprising since it has been documented elsewhere (Foley 1983, p101) that information generally becomes more complete and more accurate as the size of the establishments under investigation increases.

Although the FIR and the Dun and Bradstreet data sets perform similarly as far as coverage is concerned, there is a noticeable difference between the two data sources when we examine consistency. Table 5 shows that consistent information on employment was recorded for 69% of establishments listed in the Dun and Bradstreet data, compared with 57% of establishments contained in the FIR. The highest percentage of inconsistent information is associated with the FIR whereas no data on employment is available for nearly 20% of the large firms recorded by Dun and Bradstreet. Employment figures for establishments listed in the MLL data set have a relatively high degree of consistency. Kompass likewise appears consistent, although coverage is very limited.

To examine further how each of these sources performs in its coverage of establishments, it is possible to perform a similar type of analysis by category for data at the ward level. Table 6 indicates the occurrence and consistency of employment data from the four sources for each of 23 firms located in University Ward. At

Table 4: Large establishments (where >150 persons are employed) in Leeds recorded in different data sources

Data source	Establishments recorded	
	No.	%
FIR	181	79
D+B	180	78
MLL	130	57
KOM	87	38
Total	230	100

Table 5: The consistency of information on large establishments in Leeds

		FIR	D+B	MLL	KOM
Establishments for which data is consistent	no.	104	124	107	74
	%	57	69	82	85
Establishments for which data is inconsistent	no.	70	22	17	7
	%	39	12	13	8
Establishments for which data is not present	no.	7	34	6	6
	%	4	19	5	7

Table 6: The availability and consistency of large establishment employment data for University Ward

Establishment	FIR	D+B	MLL	KOM
1	A	B	D	D
2	A	A	A	B
3	A	B	A	D
4	B	A	A	A
5	D	A	D	D
6	A	B	A	D
7	A	B	B	A
8	A	A	D	A
9	D	A	A	A
10	A	A	D	D
11	B	A	A	A
12	D	C	A	D
13	A	A	A	A
14	A	A	D	D
15	D	A	D	D
16	D	A	B	D
17	A	A	A	A
18	A	C	D	D
19	A	D	D	D
20	B	D	A	D
21	A	A	A	A
22	B	A	D	D
23	B	D	A	A

A = Present in data set, employment information consistent
B = Present in data set, employment information inconsistent
C = Present in data set, employment information not given
D = Not present in data set

Summary: FIR A=13, B=5, C=0, D=5
D+B A=14, B=4, C=2, D=3
MLL A=12, B=2, C=0, D=9
KOM A=9, B=1, C=0, D=13

this level of resolution, the identification of establishments by only one of the data sets can become problematic and consequently, it becomes essential to adopt a survey approach or to consult detailed company reports (as occurred in this case).

The problems associated with establishment coverage, data availability and consistency that have been raised in the last two sections do detract from the benefits of using this type of information, but the results from both these pieces of research confirm the importance of using data from all possible sources in studies which seek to determine the structure of employment in a locality as comprehensively as possible. The following section of the paper contains some of the results derived from the employment information contained in the two databanks.

5. The use of establishment data to examine employment structure

The direct value of the information on employment which can be obtained from establishment data sources is in providing answers to some basic questions about industrial structure. The databanks enable investigation of the size and MLH characteristics of establishments, the status of firms as head offices or branch plants and the location patterns of firms across space.

5.1 The food and soft drinks industry in West Yorkshire

Whilst recognizing the problems of data coverage and accuracy, an attempt has been made to combine employment data from different establishment sources so as to generate a picture of the distribution of food and soft drinks manufacturing establishments in West Yorkshire across the six employment size categories indicated in Table 2. The industry in West Yorkshire appears to be dominated by firms employing 1-19 persons. They accounted for 42% of all the establishments providing employment statistics (Table 7) and moreover, over 75% of establishments in this industry employed fewer than 100 persons. There are only a dozen firms in the county employing over 500 persons, 3 of which are in the largest category and have over 1000 employees. Some comparison of the size structure of the industry in West Yorkshire can be made with the distribution of firms constituting the entire food, drink and tobacco manufacturing industry (classes 41 and 42 in the 1980 SIC) in the UK. The latter information is available from the Census of Production (BSO 1985), although it refers only to establishments with more than 20 employees. The figures in Table 7 indicate very

Table 7: Food and soft drinks manufacturing establishments in West Yorkshire and the UK, by employment size category

Employment size category	Establishments in West Yorkshire				BSO Census of Production establishments in UK, 1984	
	(a)		(b)			
	no.	%	no.	%	no.	%
1. 1 - 19	95	42.0				
2. 20 - 49	45	19.9				
20 - 99			80	60.0	2038	62.1
3. 50 - 99	35	15.5				
4. 100 - 499	39	17.3	39	30.0	1016	31.0
5. 500 - 999	9	4.0				
500+			12	10.0	228	6.9
6. 1000+	3	1.3				
Total	226	100.0	131	100.0	3282	100.0

Notes:

1. Figures under (a) refer to all establishments in the databank for which data was recorded

2. Figures under (b) refer to all establishments in the databank that employed over 20 persons

3. The figures for the UK include establishments engaged in brewing and malting, and in the production of wines, cider or tobacco

4. The figures for the UK refer to 'manufacturing units', a term generally synonymous with an 'establishment' being the smallest unit that can provide the information normally required for a census

5. Source of UK data: BSO (1985)

similar proportions of establishments in three broad size categories in West Yorkshire compared with the UK as a whole. Thus, 60% of establishments with over 20 employees in West Yorkshire employed less than 100 persons in comparison with 62.1% of establishments in the UK.

Information on the MLH category of individual establishments was available for 218 of the 226 establishments in the databank for which employment data was recorded (Table 8). Over half these establishments were classified in one of two MLHs: bread and cake manufacture (MLH 212) or meat and fish products manufacture (MLH 214). In both these sectors, there was a preponderance of small firms. Half the firms in the meat and fish products industry, for example, were classified in the smallest size category, although one establishment existed that employed over 1000 persons. In contrast, the manufacture of biscuits (MLH 213) and confectionery (MLH 213) in West Yorkshire occurred in fewer but proportionally larger establishments.

Data on the status of establishments is recorded in the Dun and Bradstreet and MLL data sources, and can be examined to indicate the extent to which establishments in West Yorkshire function as company head offices or as branch plants of larger firms. Although data was available on a total of 148 different establishments, the information on status provided by these two sources was not fully compatible. Dun and Bradstreet records an establishment as either a head office or a branch or as operating from only one location, whereas MLL records head office or branch status only. A comparison of the data sources reveals that 13 of

Table 8: Establishments in the food and soft drinks industry in West Yorkshire, by MLH and employment size

MLH Abbreviated title	Employment size category						Size			
	1-19	20-49	50-99	100-499	500-999	1000+	Total no.	%	not known	TOTAL %
211 Grain	2	1					3	1.4	1	4 1.6
212 Bread	23	12	13	10	4		62	28.4	6	68 26.7
213 Biscuits	1	3		2	1	1	8	3.7	2	12 3.9
214 Meat, fish	28	14	7	6		1	56	25.7	12	68 26.7
215 Milk	11	2	4	2	1		20	9.2	3	23 9.0
216 Sugar										0.0
217 Confect'y	5	2	1	3	2	1	14	6.4	4	18 7.1
218 Fruit	3	2		5			10	4.6	2	12 4.7
219 Animal food	6		1	2			9	4.1	3	12 4.7
221 Oils, fats	6	2	1				9	4.1	1	10 3.9
229 Other food	3	3	2	4			12	5.5	1	13 5.1
232 Soft drinks	2	3	4	4	1		14	6.4	2	16 6.3
239 Other drinks	1						1	0.5		1 0.4
Total	91	44	33	38	9	3	218	100	37	255 100
MLH not given	4	1	2	1			8		37	45
TOTAL	95	45	35	39	9	3	226		74	300

the establishments recorded by Dun and Bradstreet as operating from one location were coded by MLL as head offices. A further 61 establishments were recorded by Dun and Bradstreet as operating from one location. On the assumption that a company which operates at one location must be a head office, it was decided to regard all 74 single location establishments as head offices, particularly as this appeared to coincide with the strategy adopted by MLL. One further area of incompatibility arose because Dun and Bradstreet recorded 1 establishment as a head office, whilst MLL indicated that it was a branch. Additional information was obtained on this establishment, showing that it was the head office of a subsidiary company of an American multinational firm. It was therefore recorded as a head office. Status information for 5 other establishments, unavailable from the two main sources, was obtained as a result of a subsequent interview survey and this has been included in the data set. Hence, the total number of establishments for which details of status were available was 153, of which 133 were independent companies or the head offices of a group of companies (Table 9). Employment figures were available for 125 independent or head office establishments, indicating that almost two-thirds of the establishments employed fewer than 50 people. However, 3 establishments employed between 500 and 999 persons, and the workforce of 2 others exceeded 1000. Only 20 of the 141 establishments for which employment size and status information was available were branches, but in contrast to the head office establishments, only 15% employed fewer than 50 people. 8 of the

Table 9: Establishments in the food and soft drinks industry in West Yorkshire, by employment size and status

Employment Size category	Head Office		Branch		Total no.
	no.	%	no.	%	
1 - 19	48	38.4	2	10.0	50
20 - 49	33	26.4	1	5.0	34
50 - 99	23	18.4	2	10.0	26
100 - 499	16	12.8	8	40.0	23
500 - 999	3	2.4	6	30.0	9
1000+	2	1.6	1	5.0	3
No size data	8		0		8
TOTAL	133	100.0	20	100.0	153

branch plant establishments employed between 100 and 499 staff, and 6 employed between 500 and 999 persons.

An examination of the data on head office establishments by MLH and employment size reveals that they feature in all of the MLH categories in which establishments are found and are dispersed across the employment size categories used. In fact each of the 5 head offices that employ over 500 persons is categorized as being in a different MLH, and the 16 establishments employing between 100 and 499 persons are classified across 8 different MLHs. The MLH and size distribution of branch establishments is somewhat different in that branch establishments are concentrated in the bread industry (40% in MLH 212) and the confectionery industry (21% in MLH 217). All but one of these plants has a workforce of over 500 persons.

The spatial distribution of the establishments recorded in the databank can be analysed using information relating to their postcode address in West Yorkshire. The spatial distribution of establishments for which the postcode area is known is illustrated in Figure 1. Most of the establishments were identified in the cities of Leeds (30%) and Bradford (25%), although 21% were located in Wakefield and 11% each in the Huddersfield and Halifax postcode towns. No postcode information was obtained for 1 establishment and a further 49 establishments have been excluded from Figure 1 because only part of the postcode was available (Table 10). Establishments in the food and soft drinks manufacturing industry are generally located near to centres of population, as you might expect, although some outlying establishments are found in more rural areas. The employment size

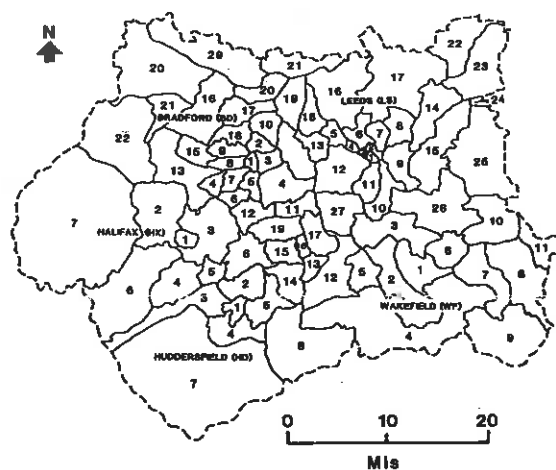
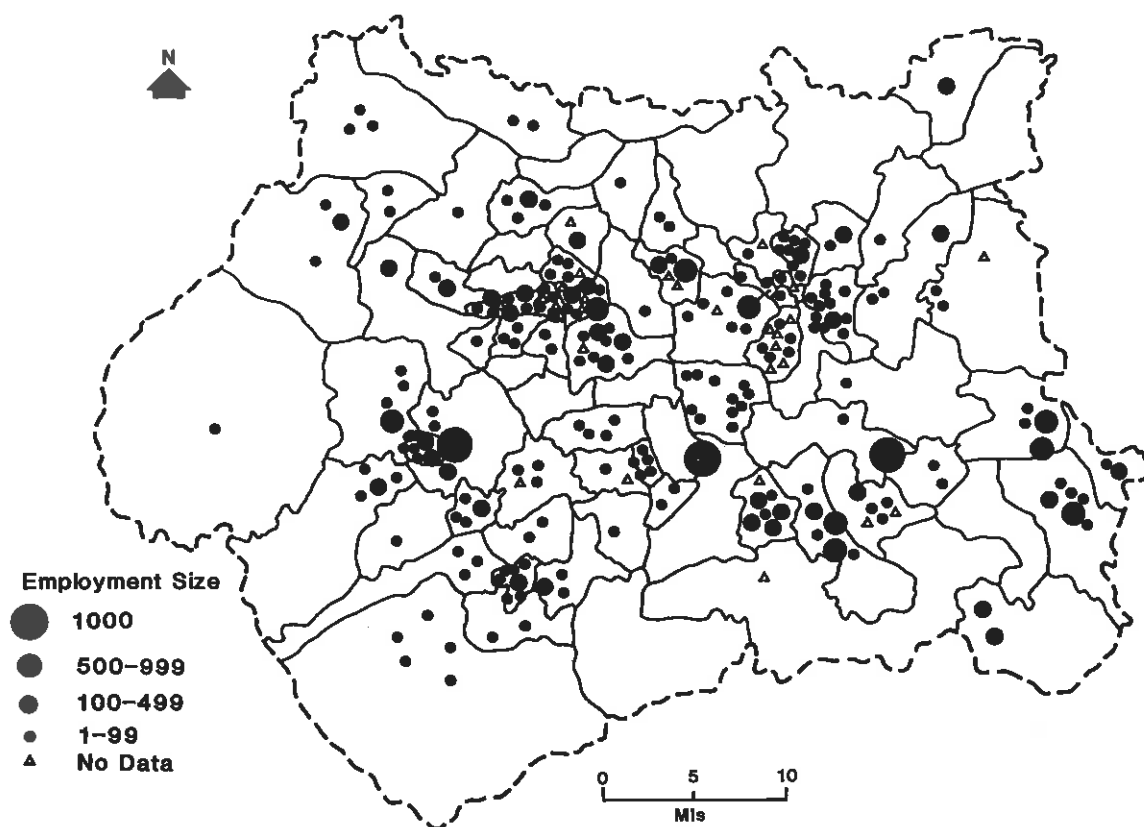


Figure 1: Spatial distribution of food and soft drinks manufacturing establishments in West Yorkshire by employment size category

Table 10: The spatial distribution of establishments in West Yorkshire by employment size

No. of persons employed	No. of establishments in					TOTAL
	Bradford	Leeds	Wakefield	Hudders'd	Halifax	
1-99	42	58	27	23	20	170
100-499	13	6	9	2	5	35
500-999	1	2	5	0	1	9
1000+	0	0	2	0	1	3
Total	56	66	43	25	27	217
Size no given	11	14	6	1	1	33
Postcode town only	9	11	15	8	6	49
TOTAL	76	91	64	34	34	299

distribution of firms in the Leeds postcode area is biased towards establishments that employ fewer than 100 persons, and although firms are quite dispersed, a few areas of concentration can be identified such as Morley (LS 27) and Beeston (LS 11) to the south-west of the city centre, and the LS 9 area between Osmondthorpe and Halton, to the south-east of the city centre. In the Bradford and Halifax areas, the majority of establishments are concentrated in the respective city centres and their adjacent postcode areas. Three-quarters of the establishments in Bradford for which employment size information is available employ fewer than 100 people, whilst 13 establishments employ between 100 and 499 workers. A significant proportion of the establishments in Halifax employed over 100 persons and one employed over 1000 staff. A relatively large proportion of the establishments in the Wakefield postcode area also employed in excess of 100 people; indeed 5 employed 500-999 persons, and 2 employed more than 1000. In contrast, all but 2 of the establishments in Huddersfield had fewer than 100 employees.

5.2 Large firms in Leeds

Previous analysis of the industrial structure of Leeds has indicated that 94% of firms have less than 62 employees and account for 40% of total employment (Dobson and Goddard 1986). Whilst small and medium-sized firms predominate, most employment is provided by the relatively small proportion of larger firms. Table 11 shows the size distribution of firms employing over 150 persons and Table 12 indicates the MLHs within which these large firms are categorized.

Table 11: Size classification of large firms in Leeds

Number of persons employed at establishment	Establishments recorded	
	No.	%
150 - 299	163	71
300 - 499	26	11
500 - 999	28	12
1000+	13	6
Total	230	100

Table 12: Large establishments in Leeds, by MLH and employment size

MLH	Abbreviated title	Employment size categories				Total	%
		150-300	300-500	500-1000	1000+		
10	Mining		1			1	0.4
21	Food	1	1	1		3	1.3
26	Coal prods.	1				1	0.4
27	Chemicals	1	1	3		5	2.2
31	Metal manuf.	2	1			3	1.3
32	Metal manuf.	3			1	4	1.7
33	Mech. eng.	11	3	4	2	20	8.7
34	Mech. eng.	1	1			2	0.9
35	Inst. eng.	2	1	1		4	1.7
36	Elec. eng.	8		1	1	10	4.3
38	Vehicles	3		2	2	7	3.0
39	Metal goods	6	1		1	8	3.5
41	Textiles	10	2			12	5.2
42	Textiles	2				2	0.9
43	Leather etc.	4				4	1.7
44	Clothing	8	1	2	1	12	5.2
46	Bricks etc.	4	1			5	2.2
47	Timber, furnit.	6		2		8	3.5
48	Paper, printing	12	1	1	1	15	6.5
49	Other manuf.	3	1	2		6	2.6
50	Construction	8		1		9	3.9
70	Transport	8	2	1		11	4.8
81/83	Dist. trades	16	3	1	1	21	9.1
86/87	Prof./Admin.	15	4	5	2	26	11.3
88	Mix. services	5	1	1	1	8	3.5
	MLH unknown	23					
TOTAL		163	26	28	13	230	100.0

There are 13 very large firms (with over 1000 employees), of which 9 are in manufacturing and 3 in services. 11.3% of all the firms identified in the databank are in professional/administrative services and 9% are in distribution services. In the manufacturing sector, mechanical engineering firms are most numerous and there are 9 firms which employ over 300 persons. It is interesting to observe that of the 207 firms where status information is available, 65% are branch plants or subsidiaries of larger companies (Table 13). Of the 41 firms employing over 500 persons, only 16 are recorded as head offices. It is worth noting that when considering ownership or status characteristics, an additional data source becomes important for more detailed study. "Who Owns Who" provides a far more extensive record of establishment/firm linkages in terms of ownership and dependency. Particularly evident is that the simple branch plant/head office dichotomy is far more complicated in reality, with small firms often being subsidiaries or branch plants of firms who themselves are actually subsidiaries of national or multinational concerns (see Clarke et al 1989c).

Finally, the spatial distribution of large firms in Leeds (Figure 2) suggests a concentration in inner city wards together with wards on a north-west/south-east axis. Further detailed description of the large firms in Leeds appears in Clarke et al (1989b).

Table 13: Status of large firms in Leeds by employment size

Employment size category	Head office		Branch	
	No.	%	No.	%
150 - 299	49	67	91	68
300 - 499	8	11	18	13
500 - 999	13	18	15	11
1000+	3	4	10	8
TOTAL	73	100	134	100

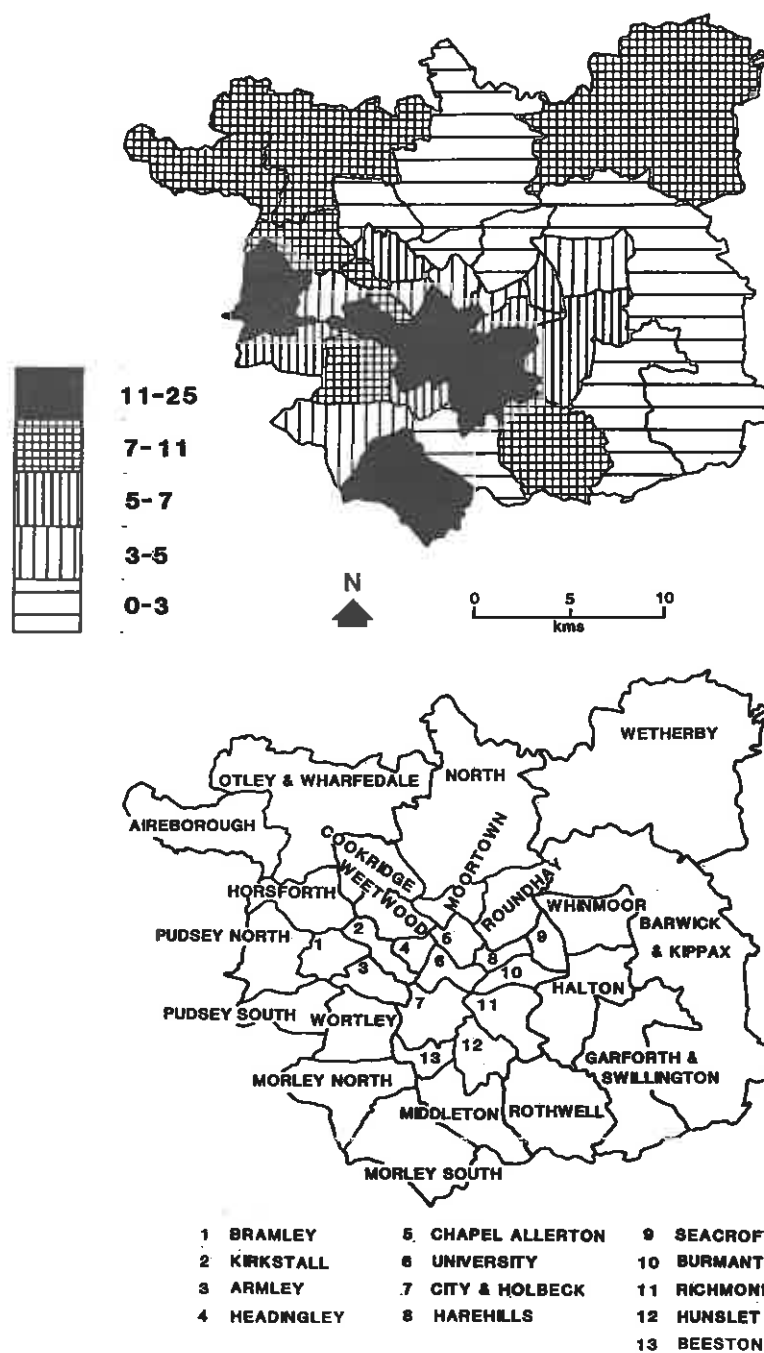


Figure 2: Spatial distribution of large firms in Leeds by ward

6. Conclusions

There has been an increasing interest in the compilation of establishment databanks over the last decade, particularly as the frequency and coverage of national firm censuses has become less certain (sampling errors of 1984 Census; 10% coverage of 1987 Census) and as the need to understand the micro processes underlying the macro economic statistics has been recognized. In this paper, we have been concerned with assessing the reliability, coverage and consistency of the major published data sources on firms. Our research reinforces the conclusion that it is crucial to draw information from all existing sources when compiling a comprehensive establishment database. It is also essential to undertake a systematic checking procedure to confirm information and to identify inconsistency. Questionnaire surveys provide a valuable source of up-to-date information in this context, but poor and slow response limits their utility. Company reports are often useful, especially for information on single, independent establishment enterprises. The news that companies may soon be required to include in their reports statements about the capital and workforce in all branches of their organization is to be welcomed insofar as this would increase the level of information that can be derived from published accounts and enable more rigorous checking of data accuracy.

On the basis of the two databases constructed, it appears that the FIR and the Dun and Bradstreet data sources provide the most comprehensive coverage of firms, although information on employment is not always available from the latter. The problem of

inconsistent data from different sources is ameliorated by using broad employment size bands but assumptions have to be made to resolve remaining inconsistencies. The Dun and Bradstreet data contains the highest percentage of establishments with employment data that is consistent between sources in the case of the food industry, although the Kompass directory provides the most consistent employment figures on large firms. Generally speaking, whereas information on large firms is available and accurate, data for smaller firms, particularly service activities, tends to be less reliable. The shortcomings associated with the data sources described in this paper does not deter from the need to continue to construct comprehensive databases containing accurate information in order to establish a full understanding of the geography of enterprise.

References

- Aubrey, J. (1988) Employment change in West Yorkshire with special reference to food and soft drinks manufacture, Unpublished PhD Thesis, School of Geography, University of Leeds
- BSO (1985) Business Monitor, PA1003, Analyses of UK manufacturing (local) units by employment size, 1984, HMSO, London
- Clarke, G., Crewe, L. and Leigh, C. (1989a) Economic change in a local economy: I The West Yorkshire case, Working Paper, School of Geography, University of Leeds
- Clarke, G., Crewe, L. and Leigh, C. (1989b) Economic change in a local economy: II The Leeds case, Working Paper 525, School of Geography, University of Leeds
- Clarke, G., Crewe, L. and Leigh, C. (1989c) Economic change in a local economy: III An enterprise study of West Yorkshire, Working Paper, School of Geography, University of Leeds
- Dicken, P. and Lloyd, P. (1978) Inner metropolitan change, enterprise structures and policy issues, Regional Studies, 12, 401-412
- Dobson, S. and Goddard, J. (1986) Local Economic Policy in Three Cities, Leeds University Press, Leeds
- Foley, P. (1983) A comparison of four industrial data sources, Chapter 6 in Healey, M. (ed) Urban and Regional Industrial Research: The Changing UK Database, Geo Books, Norwich
- Fothergill, S. and Gudgin, G. (1982) Unequal Growth: Urban and Regional Employment Change in the United Kingdom, Heinemann, London
- Gallagher, C.C. and Doyle, J. (1986) Job generation research: a reply to Storey and Johnson, International Small Business Journal, 4(4), 47-54
- Gallagher, C.C. and Stewart, H. (1986) Jobs and the business life cycle in the UK, Applied Economics, 18, 875-900
- Healey, M.J. (ed) (1983) Urban and Regional Industrial Research: The Changing UK Database, Geo Books, Norwich
- Healey, M.J. and Clark, D. (1985) Industrial decline in a local economy: the case of Coventry, 1974-1982, Environment and Planning A, 17, 1351-1368

- Lloyd, P. and Mason, C. (1978) Manufacturing industry in the inner city: a case study of Greater Manchester, Transactions, Institute of British Geographers, 3, 66-89
- Lloyd, P. and Shutt, J. (1985) Recession and restructuring in the North-West region, 1974-82: the implications of recent events, Chapter 2 in Massey, D.B. and Meegan, R. (eds) Politics and Method. Contrasting Studies in Industrial Geography, Methuen, London
- LIERG (1982) Monitoring manufacturing employment change in London, 1976-1981: the implications for local economic policy, Final Report to the Department of Environment, Middlesex Polytechnic, Enfield
- Massey, D.B. (1984) Spatial Divisions of Labour. Social Structures and the Geography of Production, Macmillan, London
- Massey, D.B. and Meegan, R.A. (1982) The Anatomy of Job Loss: The How, Why and Where of Employment Decline, Methuen, London
- Morgan, K. and Sayer, A. (1985) A 'modern' industry in a 'mature' region: the remaking of management labour relations, Journal of Urban and Industrial Research, 9(3), 383-403
- North, D., Leigh, R. and Gough, J. (1983) Monitoring industrial change at the local level: some comments on methods and data sources, Chapter 8 in Healey, M.J. (ed) Urban and Regional Industrial Research: The Changing UK Database, Geo Books, Norwich
- Palmer, J. (1986a) Sectoral and spatial characteristics of employment in West Yorkshire, 1971-1981, Working Paper 458, School of Geography, University of Leeds
- Palmer, J. (1986b) A shift-share analysis of employment change in West Yorkshire, 1971-1981, Working Paper 463, School of Geography, University of Leeds
- Thompson, A. (1983) The prospects for establishment level databanks, Chapter 5 in Healey, M.J. (ed) Urban and Regional Industrial Research. The Changing UK Database, Geo Books, Norwich