

1. BACKGROUND

Changes in definitions of area boundaries and in the definitions of relevant populations make it very difficult to work with official statistics and obtain the relevant labour market statistics. The censuses between 1931 and 1991 have more consistent definitions of aggregate labour market statistics than, for example, the time series data of the Ministry of Labour Gazette, Abstract of Labour Statistics, but the censuses only provide these statistics every 10 years. In this report we use the census definitions as a base and interpolate the between census statistics for Great Britain.

An entropy maximizing approach was used to obtain an annual time series for the population above school leaving age, the economically active and the unemployed, disaggregated by area between the census values. Our approach ensures that the interpolated data are reasonably consistent with the aggregate annual data. Our sources of aggregate data were the Annual Abstract of Statistics, Vols (82-131) and the British Labour Statistics, Historical Abstracts (1971). This approach is similar to that of Crouchley et al. (1991). We obtained data for all counties in England and Wales and for all regions in Scotland, as defined in the 1991 census. The list of geographically defined areas is presented in Appendix A. The census data for earlier times was converted to the 1991 boundaries (see Section 3).

In Section 5 we note some problems with the interpolated data that still need to be resolved.

2. SOURCES AND CLASSIFICATION OF CENSUS DATA.

Census occupational data is available for the years 1931, 1951, 1961, 1971, 1981 & 1991. The exact source and classification of this data is described below.

Note that as well as total figures for each county/region in each year, data was also held for males & females separately.

1931

England & Wales

Source: Census 1931, England and Wales - Occupation Tables

Table 16 - Occupations of males and females aged 14 years and over showing also the total "operatives" and the total "out of work"

Data Held : Population aged 14 years and over
 Out of Work : Number (Unemployed)
 Occupied 14 years and over (Active)

Scotland

Source: Census of Scotland 1931, Occupation Tables

Table 2 - Occupations of males and females in cities, counties & large burghs, showing also the total "operatives" and the total "out of work"

Data Held : Population aged 14 years and over
 Out of Work : Number (Unemployed)
 Gainfully Occupied, aged 14 years and over (Active)

1951

England & Wales

Source: Census 1951, England and Wales - Occupation Tables

Table 20 - Selected occupations with status aggregates

Data Held : Population aged 15 years and over
 Out of Work (Unemployed)
 Occupied (Active)

1951

Scotland

Source: Census of Scotland 1951, Vols II-V, Occupation Tables
Table 6 - Occupations & industrial status aggregates of males and females in central Clydeside conurbation, cities, counties & large burghs

Data Held : Total Population aged 15 years and over
 Out of Work (Unemployed)
 Total Gainfully Occupied (Active)

1961

England & Wales

Source: Census 1961, England and Wales - Economic Activity (published in individual county leaflets)
Table 1 - Occupation and Status (10% sample)

Data Held : Population aged 15 years and over
 Out of Employment
 Economically Active

Scotland

Source: Census 1961, Scotland: Occupation & Industry County Tables
Table 1 - Occupation and Status : Cities, counties, large burghs, small burghs, county remainders, conurbation centre, new towns (10% sample)

Data Held : Population aged 15 years and over
 Out of Employment
 Economically Active

1971

England & Wales

Source: Census 1971, England and Wales - Occupation Industry Socio-Economic Groups Tables
(published as individual county leaflets)
Table 1 - Occupation and status by area of usual residence and sex (10% sample)

Data Held : Population aged 15 years and over
 Out of Employment
 Economically Active

Scotland

Source: Census 1971, Scotland: Economic Activity County Tables (parts I-IV)
Table 1 - Occupation and Status by area of usual residence and sex : planning sub-regions, cities, counties, large burghs, county remainders, conurbation centre, new towns (10% sample)

Data Held : Population aged 15 years and over
Out of Employment
Economically Active

1981

England & Wales

Source: Census 1981, England and Wales - Economic Activity (county reports on microfiche)
Table 1 - Usually resident (economic activity) population : economic position and employment status by area of usual residence and area of workplace by sex

Data Held : Population aged 16 years and over
 Out of Employment
 Economically Active

Scotland

Source: Census 1981 Scotland- Economic Activity (data stored for each region on microfiche)
Table 1 - Usually resident (economic activity) population : economic position and employment status by area of usual residence and area of workplace by sex (10% sample)

Data Held : Population aged 16 years and over
 Out of Employment
 Economically Active

1991

England & Wales

Source: Census 1991, England and Wales : County Reports - part 2
Table 72 - Economic & Employment Status (10% sample)

Data Held : Population aged 16 and over
 Out of Employment
 Economically Active

Scotland

Source: 1991 Census, Economic Activity, Scotland
Table 1 - Economic Position (Scotland, Region & Island Areas)

Data Held : Total persons ages 16 and over
 Unemployed
 Economically Active

3. ACCOUNTING FOR BOUNDARY CHANGES

3.1 ENGLAND & WALES

Substantial boundary changes took place between 1931 and 1991, therefore a direct comparison of the data cannot be made. However information is given in each of the census county reports regarding the change in population and area caused by each of the boundary changes (see following pages). The composition of the new counties were calculated as population ratios of the old counties.

For example:

Intercensal changes of boundary 1971 - 1974.

Existing area (1974)	Composition of exiting areas	Area (hectares)	Population (1971)
AVON	Gloucestershire	61887	609582
	Somerset	<u>72711</u>	<u>296308</u>
	Total	134598	905890

	A	B	C	D	Z
	County (pre change)	Economically Active Males	Economically Active Females	etc ..	Total Population (1971)
19	Gloucestershire	xxxxxx	xxxxx	xxxxx	xxxxx
	etc...				
39	Somerset	xxxxxx	xxxxx	xxxxx	xxxxx
	County (after change)				
	AVON	calculations below	xxxxx	xxxxx	905890

Calculations for AVON.

$$\text{Economically Active Males} = ((609582 / Z19) * B19) + ((296308 / Z39) * B39)$$

$$\text{Economically Active Females} = ((609582 / Z19) * C19) + ((296308 / Z39) * C39)$$

and so on.

The aim was to get all of the data to the 1991 county boundary level. For the 1981 census data this involves taking account of only one set of boundary changes, between 1981 and 1991. For the 1971 census there were three sets of changes - those between 1971 and 1974, 1974 and 1981, 1981 and 1991. Moving back through time each preceding census involves taking account of one extra set of changes.

The following pages list all the changes in boundary which caused a change in population. Further changes may have taken place, causing a change in **area only** - these are not recorded.

1931 to 1951

Source: 1931 Census - County Reports Part II,

Table B - Areas which have been altered between 26th April, 1931 and XXXX (see note below) showing constitutions as at the latter date in terms of constitutions as at the former date, together with particulars of acreage and population.

AND 1951 Census

Table 5 - Intercensal changes of boundary subsequent to those published in 1931 Census County Report, Part II (i.e. between XXXX and 8th April, 1951).

XXXX - Date varies between different counties.

Existing Area (1951)	Composition	Area (acres)	Population (1931)
BUCKINGHAMSHIRE	Buckinghamshire	477980	271305
	Oxfordshire	<u>1431</u>	<u>118</u>
		479411	271423
CHESHIRE	Cheshire		1084637
	Derbyshire		<u>3638</u>
			1088275
DERBYSHIRE	Derbyshire	642376	750831
	<i>Derbyshire</i>	<i>638362</i>	<i>747193</i>
	<i>Cheshire</i>	<i><u>5210</u></i>	<i><u>3018</u></i>
		<i>643572</i>	<i>750211</i>
GLOUCESTERSHIRE	Gloucestershire	800099	785503
	Somersetshire	<u>2889</u>	<u>5030</u>
		802988	790533
ELY, ISLE OF	Isle of Ely	237179	77197
	Lincolnshire (Parts of Holland)	1274	162
	Norfolk	<u>1497</u>	<u>3505</u>
		239950	80864
LEICESTERSHIRE	Leicestershire	532145	541560
	Warwickshire	<u>240</u>	<u>75</u>
		532385	541635
LINCOLNSHIRE (PARTS OF HOLLAND)	Lincolnshire (Parts of Holland)	267125	92034
	Isle of Ely	221	26
	Lincolnshire (Parts of Kesteven)	39	7
	Lincolnshire (Parts of Lindsey)	<u>464</u>	<u>59</u>
		267849	92126
LINCOLNSHIRE (PARTS OF KESTEVEN)	Lincolnshire (Parts of Kesteven)	463466	110053
	Lincolnshire (Parts of Holland)	<u>24</u>	<u>95</u>
		463490	110148
LINCOLNSHIRE (PARTS OF LINDSEY)	Lincolnshire (Parts of Lindsey)	972332	422140
	Lincolnshire (Parts of Holland)	<u>569</u>	<u>39</u>
		972901	422179
NORFOLK	Norfolk	1313567	501435
	Isle of Ely	<u>673</u>	<u>475</u>
		1314240	501910
OXFORDSHIRE	<i>Oxfordshire</i>	<i>477793</i>	<i>209503</i>
	<i>Buckinghamshire</i>	<i><u>1380</u></i>	<i><u>281</u></i>
		<i>479173</i>	<i>209784</i>
SOMERSET	Somerset	1034051	470112

	<i>Somerset</i>	<i>1034051</i>	<i>470112</i>
	<i>Wiltshire</i>	<u><i>218</i></u>	<u><i>180</i></u>
		<i>1034269</i>	<i>470292</i>
STAFFORDSHIRE	Staffordshire	737865	1431359
	Derbyshire	16	43
	Warwickshire	615	2517
	Worcestershire	<u>17</u>	-
		738513	1433919

WARWICKSHIRE	Warwickshire	624061	1532490
	<i>Warwickshire</i>	<i>623821</i>	<i>1532415</i>
	<i>Leicestershire</i>	<i>634</i>	<i>301</i>
	<i>Gloucestershire</i>	<i>4539</i>	<i>497</i>
		<i>628994</i>	<i>1533213</i>
WILTSHIRE	<i>Wiltshire</i>	860611	303193
YORKSHIRE, WEST RIDING	Yorkshire, West Riding		3437368
	Derbyshire		1006500
			4443868
GLAMORGAN	<i>Glamorganshire</i>	<i>520456</i>	<i>1225717</i>
	<i>Monmouthshire</i>	<i>2076</i>	<i>3348</i>
		<i>522532</i>	<i>1229065</i>
MONMOUTHSHIRE	<i>Monmouthshire</i>	347493	431610

NB. Owing to the loss of the 1931 Census records by a fire in 1941, boundary changes taking place after 1941 are not recorded. However, in the case of local authority areas the changes are slight. See page vii, 1931 Census County Reports, Part II (Point 2) for more information.

1951 to 1961

Source: Census, 1961 - County Reports,

Table 4 - Intercensal changes of boundary (between 8th April, 1951 and 23rd April, 1961).

Existing Area (1961)	Composition	Area (acres)	Population (1951)
BEDFORDSHIRE	Bedfordshire	302940	311937
	Hertfordshire	<u>under 1 acre</u>	-
		302940	311937
	Bedfordshire	302939	311937
	Buckinghamshire	<u>2</u>	-
	302940	311937	
BUCKINGHAMSHIRE	Buckinghamshire	479406	386291
	Buckinghamshire	479406	386291
	Oxfordshire	<u>under 1 acre</u>	-
		479406	386291
	Buckinghamshire	479404	386291
	<u>2</u>	-	
	479406	386291	
HERTFORDSHIRE	Hertfordshire	404525	609775
	Bedfordshire	<u>1</u>	-
		404526	609775
HUNTINGDONSHIRE	Huntingdonshire	233978	69302
	Soke of Peterborough	<u>7</u>	-
		233985	69302
LINCOLNSHIRE (PARTS OF HOLLAND)	Lincolnshire (Parts of Holland)	267825	101555
	Norfolk	<u>23</u>	-
		267847	101555
LINCOLNSHIRE (PARTS OF KESTEVEN)	Lincolnshire (Parts of Kesteven)	462100	129785

LINCOLNSHIRE (PARTS OF LINDSEY)	Lincolnshire (Parts of Lindsey)	973048	473550
	Lincolnshire (Parts of Kesteven)	<u>1390</u>	<u>932</u>
		974438	474482
NORFOLK	Norfolk	1314308	548062
	Lincolnshire (Parts of Holland)	<u>24</u>	-
		1314332	548062

OXFORDSHIRE	Oxfordshire	479172	275808
	Buckinghamshire	<u>5</u>	-
		479177	275808
	Oxfordshire	479177	275808
	Buckinghamshire	<u>under 1 acre</u>	-
		479178	275808
PETERBOROUGH, SOKE OF	Soke of Peterborough	53456	63791
	Huntingdonshire	<u>8</u>	-
		53463	63791
STAFFORDSHIRE	Staffordshire	738258	1619097
SURREY	Surrey	461829	1602483
	London	<u>3</u>	<u>26</u>
		461833	1602509
SUSSEX, EAST	East Sussex	527210	614547
SUSSEX, WEST	West Sussex	402001	318823
	East Sussex	<u>3347</u>	<u>3969</u>
		405348	322792
WORCESTERSHIRE	Worcestershire	447679	522846
	Staffordshire	<u>264</u>	<u>1937</u>
		447943	524783

1961 to 1971

Source: Census 1971, County Reports,

Table 4 - Intercensal changes of boundary (between 23rd April, 1961 and 25th April, 1971).

NB. A hectare is equivalent to 2.471 acres.

Existing Area (1971)	Composition	Area (hectares)	Population (1961)
BEDFORDSHIRE	Bedfordshire	121960	378237
	Buckinghamshire	671	4164
	Cambridgeshire	445	71
	Hertfordshire	45	200
	Huntingdon & Peterborough	313	34
	Northamptonshire	<u>30</u>	-
		123464	382706
BUCKINGHAMSHIRE	Buckinghamshire	193334	484069
	Bedfordshire	<u>3</u>	<u>46</u>
		193337	484115
CAMBRIDGESHIRE & ISLE OF ELY	Cambridgeshire	127028	190240
	Essex	216	105
	Huntingdonshire	31	14
	Isle of Ely	<u>87839</u>	<u>87021</u>
		215114	277380
CHESHIRE	Cheshire	263064	1368673
	Shropshire	< 1 hectare	5
	Staffordshire	<u>109</u>	<u>63</u>
		263173	1368741
CORNWALL & ISLES OF SCILLY	Cornwall	351370	342301
	Devon	<u>4890</u>	<u>977</u>

		356260	343278
DERBYSHIRE	Derbyshire	260407	877595
	Leicestershire	<u>15</u>	-
		260422	877595
	Derbyshire	258303	845371
	Yorkshire, West Riding	<u>3</u>	-
		258306	845371

DEVON	Devon	671030	822682
	Cornwall	33	-
	Dorset	11	3
	Somerset	<u>6</u>	<u>14</u>
		671080	822699
DORSET	Dorset	252439	313379
	Devon	278	55
	Somerset	<u>520</u>	<u>146</u>
		253237	313580
DURHAM	Durham	262853	1515643
	Durham	256601	1402223
ESSEX	Essex	367318	1103543
	Cambridgeshire & Isle of Ely	<u>66</u>	<u>73</u>
		367384	1103616
GLOUCESTERSHIRE	Gloucestershire	325267	1001431
	Herefordshire	135	123
	Worcestershire	463	79
		325865	1001633
	Gloucestershire	325817	1001631
	Somerset	31	181
	Wiltshire	<u>200</u>	<u>28</u>
	326048	1001840	
GREATER LONDON	London	30312	3200484
	Essex	28279	1184410
	Hertfordshire	2806	68347
	Kent	21966	504333
	Middlesex	52071	2127892
	Surrey	<u>24214</u>	<u>911626</u>
		159648	7997092
HEREFORDSHIRE	Herefordshire	217951	130805
	Gloucestershire	<u>223</u>	<u>207</u>
		218174	131012
HERTFORDSHIRE	Hertfordshire	160856	764354
	Bedfordshire	75	120
	Middlesex	<u>2480</u>	<u>23376</u>
		163411	787850
HUNTINGDON & PETERBOROUGH	Bedfordshire	539	2373
	Cambridgeshire	7	-
	Huntingdonshire	94295	79872
	Isle of Ely	9265	2159
	Northamptonshire	68	13
	Soke of Peterborough	<u>21627</u>	<u>74758</u>
	125801	159175	
KENT	Kent	372422	1197518
	Kent	372422	1197518
	Greater London	<u>722</u>	<u>1046</u>
		373144	1198564
LEICESTERSHIRE	Leicestershire	215371	682566
	Derbyshire	40	25
	Lincolnshire (Parts of Kesteven)	159	25
	Northamptonshire	44	-

	Nottinghamshire	307	12
	Warwickshire	<u>7</u>	<u>21</u>
		215928	682649
LINCOLNSHIRE (PARTS OF KESTEVEN)	Lincolnshire (Parts of Kesteven)	189893	211894
	Leicestershire	<u>14</u>	-
		189907	211894
	Lincolnshire (Parts of Kesteven)	189907	211894
	Lincolnshire (Parts of Lindsey)	<u>255</u>	<u>589</u>
		190162	212483

NORTHAMPTONSHIRE	Northamptonshire	236659	397992
	Bedfordshire	19	61
	Huntingdonshire	48	4
	Leicestershire	4	-
	Soke of Peterborough	<u>8</u>	-
		236738	398057
NOTTINGHAMSHIRE	Nottinghamshire	218236	902976
	Leicestershire	<u>21</u>	-
	218257	902976	
SHROPSHIRE	Shropshire	348641	297450
	Staffordshire	385	292
	Worcestershire	4	-
		349030	297742
SOMERSET	Somerset	417205	598705
	Devon	293	37
	Dorset	110	78
	Gloucestershire	< 1 hectare	2
	Wiltshire	<u>69</u>	<u>7</u>
		417677	598829
STAFFORDSHIRE	Staffordshire	298266	1733164
	Cheshire	108	306
	Shropshire	112	11
	Warwickshire	<u>2002</u>	<u>11783</u>
		300488	1745264
	Staffordshire	297772	1625515
	Warwickshire	113	763
	Worcestershire	<u>1753</u>	<u>62691</u>
		299638	1688969
	SURREY	Surrey	162678
Middlesex		<u>5617</u>	<u>83275</u>
		168295	902691
Surrey		168295	902691
Greater London		<u>979</u>	<u>3500</u>
		169274	906191
Surrey		169267	906191
Greater London		<u>4</u>	<u>103</u>
		169271	906294
WARWICKSHIRE		Warwickshire	254356
	Warwickshire	252289	2012758
	Leicestershire	<u>28</u>	<u>2</u>
		252317	2012760
	Warwickshire	252138	2009837
	Staffordshire	46	811
	Worcestershire	<u>210</u>	<u>5939</u>
		252394	2016587
Warwickshire	252147	2016517	
WILTSHIRE	Wiltshire	348009	422950

	Gloucestershire	48	-
	Somerset	<u>16</u>	-
		348073	422950

WORCESTERSHIRE	Worcestershire	181279	569957
	Warwickshire	<u>180</u>	<u>718</u>
		181459	570675
	Worcestershire	180992	570596
	Gloucestershire	250	68
	Herefordshire	9	-
	Warwickshire	<u>58</u>	<u>196</u>
		181309	570860
	Worcestershire	179346	502230
	Staffordshire	2670	118938
	Warwickshire	<u>66</u>	<u>2160</u>
		182082	623328
	Worcestershire	182082	623328
	Warwickshire	<u>247</u>	<u>70</u>
	182329	623398	
YORKSHIRE, EAST RIDING	Yorkshire, East Riding	303632	526510
YORKSHIRE, NORTH RIDING	Yorkshire, North Riding	551109	554102
	Durham	<1 hectare	-
		551109	554102
	Yorkshire, North Riding	551054	551143
	Durham	6252	113420
	Yorkshire, West Riding	<1 hectare	-
		557306	664563
YORKSHIRE, WEST RIDING	Yorkshire, West Riding	722685	3644582
	Derbyshire	<u>2119</u>	<u>32224</u>
		724804	3676806
	Yorkshire, West Riding	724804	3676806
	Yorkshire, East Riding	62	782
	Yorkshire, North Riding	<u>55</u>	<u>2959</u>
		724921	3680547
GLAMORGAN	Glamorgan	211734	1229697
	Monmouthshire	<u>12</u>	<u>10</u>
		211746	1229707
MONMOUTHSHIRE	Monmouthshire	140334	444669
	Glamorgan	<u>1</u>	<u>31</u>
		140335	444700

1971 to 1974

Source: Census 1971, England and Wales, County Reports (as constituted on 1st April, 1974).

Table 4 - Intercensal changes of boundary (between 25th April, 1971 and 1st April, 1974).

Existing Area (1974)	Composition	Area (hectares)	Population (1971)
AVON	Gloucestershire	61887	609582

	Somerset	<u>72711</u> 134598	<u>296308</u> 905890
BERKSHIRE	Berkshire Buckinghamshire	120497 <u>5038</u> 125535	513275 <u>111337</u> 624612
BUCKINGHAMSHIRE	Buckinghamshire	188289	476222
CAMBRIDGESHIRE	Cambridgeshire & Isle of Ely Huntingdon & Peterborough	215113 <u>125798</u> 340911	303044 <u>202623</u> 505667
CESHIRE	Cheshire Lancashire	217854 <u>14993</u> 232847	679959 <u>186597</u> 866556
CLEVELAND	Durham Yorkshire, North Riding	18071 <u>40238</u> 58310	110381 <u>457385</u> 567766
CUMBRIA	Cumberland Lancashire Westmorland Yorkshire, West Riding	393849 61337 204334 <u>21317</u> 680837	292187 107566 72836 <u>3544</u> 476133
DERBYSHIRE	Derbyshire Cheshire	258308 <u>4798</u> 263106	885131 <u>1480</u> 886611
DORSET	Dorset Hampshire	253237 <u>12164</u> 265401	361919 <u>192475</u> 554394
DURHAM	Durham Yorkshire, North Riding	204087 <u>39510</u> 243597	603758 <u>3416</u> 607174
GLOUCESTERSHIRE	Gloucestershire	264156	467126
GREATER MANCHESTER	Cheshire Lancashire Yorkshire, West Riding	25504 95688 <u>7480</u> 128673	509137 2199290 <u>20570</u> 2728997
HAMPSHIRE	Hampshire	377358	1373008
HEREFORD & WORCESTERSHIRE	Herefordshire Worcestershire	218176 <u>174496</u> 392672	138639 <u>421362</u> 560001
HUMBERSIDE	Lincoln (Parts of Lindsey) Yorkshire, East Riding Yorkshire, West Riding	101354 234366 <u>15409</u> 351129	305651 505436 <u>27605</u> 838692
LANCASHIRE	Lancashire Yorkshire, West Riding	265783 <u>38518</u> 304301	1324236 <u>20526</u> 1344762
LEICESTERSHIRE	Leicestershire Rutland	215927 <u>39365</u> 255292	772102 <u>27469</u> 799571
LINCOLNSHIRE	Lincolnshire (Parts of Holland) Lincolnshire (Parts of Kesteven) Lincolnshire (Parts of Lindsey)	108464 190178 <u>289916</u> 588558	105690 232549 <u>165258</u> 503497

MERSEYSIDE	Cheshire	15685	355811
	Lancashire	<u>49103</u>	<u>1300734</u>
		64789	1656545
NORFOLK	Norfolk	531877	617616
	East Suffolk	<u>3651</u>	<u>8176</u>
		535528	625792
NORTHUMBERLAND	Northumberland	503293	279556
NOTTINGHAMSHIRE	Nottinghamshire	216365	974573
OXFORDSHIRE	Oxfordshire	193929	381590
	Berkshire	<u>67220</u>	<u>123582</u>
		261149	505172
SOMERSET	Somerset	344969	386356
STAFFORDSHIRE	Staffordshire	271614	963737
SUFFOLK	East Suffolk	221816	373284
	West Suffolk	<u>158204</u>	<u>164734</u>
		380020	538018
SUSSEX, EAST	East Sussex	179533	647460
SUSSEX, WEST	West Sussex	163994	492495
	East Sussex	33803	100514
	Surrey	<u>1337</u>	<u>637</u>
		199134	593646
TYNE & WEAR	Durham	34445	695498
	Northumberland	<u>19564</u>	<u>516196</u>
		54009	1211694
WARWICKSHIRE	Warwickshire	198058	455450
WEST MIDLANDS	Staffordshire	28021	894618
	Warwickshire	54090	1626779
	Worcestershire	7831	271891
		89943	2793288
YORKSHIRE, NORTH	Yorkshire, East Riding	69202	37880
	Yorkshire, North Riding	477556	264857
	Yorkshire, West Riding	<u>284115</u>	<u>324454</u>
		830872	627191
YORKSHIRE, SOUTH	Nottinghamshire	1876	1840
	Yorkshire, West Riding	<u>154174</u>	<u>1320674</u>
		156049	1322514
YORKSHIRE, WEST	Yorkshire, West Riding	203914	2067642
CLWYD	Denbighshire	157003	178986
	Flintshire	66393	175769
	Meirionethshire	<u>19207</u>	<u>3826</u>
		242603	358581
DYFED	Cardiganshire	179350	54882
	Carmarthenshire	238286	162562
	Pembrokeshire	<u>159115</u>	<u>98968</u>
		576751	316412
GLAMORGAN, MID	Breconshire	8060	5844
	Monmouthshire	4435	29605
	Glamorgan	<u>89365</u>	<u>496398</u>
		101861	531847
GLAMORGAN, SOUTH	Glamorgan	40864	389086
	Monmouthshire	<u>750</u>	<u>1183</u>
		41614	390269

GLAMORGAN, WEST	Glamorgan	81611	373246
GWENT	Breconshire	2419	9758
	Monmouthshire	<u>135152</u>	<u>431383</u>
		137571	441141
GWYNEDD	Anglesey	71507	59761
	Caernarvonshire	147349	123064
	Denbighshire	16200	6206
	Meirionethshire	<u>151722</u>	<u>31504</u>
		386778	220535
POWYS	Breconshire	179431	37775
	Montgomeryshire	206435	43119
	Radnorshire	<u>121878</u>	<u>18279</u>
		507744	99173

1974 to 1981

Source: Census 1981, County Reports,

Table 2 - Intercensal changes of boundary (between 1st April, 1975 and 5th April, 1981).

Existing Area (1981)	Composition	Area (hectares)	Population (1971)
BERKSHIRE	Berkshire	125494	624420
	Buckinghamshire	28	163
	Oxfordshire	368	6860
		125890	631443
BUCKINGHAMSHIRE	Buckinghamshire	188259	476059
	Berkshire	25	192
		188284	476251
OXFORDSHIRE	Oxfordshire	260773	498312
	Berkshire	9	-
		260782	498312

1981 to 1991

Source: Census 1991, County Report Part II, Annex A - Changes of boundary between 5/4/81 and 21/4/91.

Existing Area (1991)	Composition	Population (1981)
AVON	Avon	914623
	Wiltshire	13
		914636
BEDFORDSHIRE	Bedfordshire	506837
	Buckinghamshire	5
	Cambridgeshire	13
		506855
BERKSHIRE	Berkshire	679949
	Wiltshire	4
	Buckinghamshire	-
	Hampshire	264
	Oxfordshire	28
	Surrey	1455
		681700
BUCKINGHAMSHIRE	Buckinghamshire	565835
	Berkshire	235
	Bedfordshire	190
	Hertfordshire	19
	Northamptonshire	5
	Oxfordshire	2
		566286
CAMBRIDGESHIRE	Cambridgeshire	576675
	Essex	8
	Bedfordshire	27
	576710	
CHESHIRE	Cheshire	929961
CLEVELAND	Cleveland	567930
	Durham	119
		568049

CUMBRIA	Cumbria Northumberland	487033 <u>3</u> 487036
DERBYSHIRE	Derbyshire Nottinghamshire Leicestershire Staffordshire	910102 29 6 4 910141
DORSET	Dorset	595413
DURHAM	Durham Cleveland	607075 28 607103
ESSEX	Essex	1474240
GLOUCESTERSHIRE	Gloucestershire Avon	501673 <u>502</u> 502175
GREATER LONDON	Greater London Buckinghamshire	4215187 <u>170</u> 4215357
GREATER MANCHESTER	Greater Manchester	2595705
HAMPSHIRE	Hampshire Berkshire	1466121 <u>1021</u> 1467142
HERTFORDSHIRE	Hertfordshire Cambridgeshire Buckinghamshire	956498 761 <u>1969</u> 959228
HUMBERSIDE	Humberside	852418
LANCASHIRE	Lancashire Greater Manchester Cumbria	1376519 48 5 1376572
LEICESTERSHIRE	Leicestershire Lincolnshire Warwickshire	844412 5 <u>72</u> 844489
LINCOLNSHIRE	Lincolnshire Cambridgeshire Nottinghamshire Leicestershire	550753 168 105 <u>107</u> 551133
NORFOLK	Norfolk Cambridgeshire	694566 <u>1117</u> 695683
NORTHAMPTONSHIRE	Northamptonshire	528443
NORTHUMBERLAND	Northumberland	299481
NOTTINGHAMSHIRE	Nottinghamshire	985149
OXFORDSHIRE	Oxfordshire	519460
SOMERSET	Somerset Avon Dorset	427114 51 <u>2</u> 427114

STAFFORDSHIRE	Staffordshire Cheshire Derbyshire	1015616 20 <u>71</u> 1015707
SUFFOLK	Suffolk Essex	598335 <u>52</u> 598387
SURREY	Surrey Berkshire	1002877 21 1002898
WARWICKSHIRE	Warwickshire	476243
WILTSHIRE	Wiltshire	518528
YORKSHIRE, NORTH	North Yorkshire West Yorkshire Humberside Durham	666951 149 2 <u>4</u> 667106
YORKSHIRE, WEST	West Yorkshire	2037016
CLWYD	Clwyd Gwynedd	391081 <u>20</u> 391101
DYFED	Dyfed Powys	330163 <u>16</u> 330179
GLAMORGAN, MID	Mid Glamorgan South Glamorgan Gwent	538234 34 <u>6</u> 538274
GLAMORGAN, SOUTH	South Glamorgan Mid Glamorgan	383996 <u>71</u> 384067
GLAMORGAN, WEST	West Glamorgan Mid Glamorgan Powys Dyfed	367548 169 30 <u>6</u> 367753
GWYNEDD	Gwynedd Powys	230026 <u>10</u> 230036
POWYS	Powys West Glamorgan Gwynedd Dyfed	110499 50 2 <u>9</u> 110560

3.2 SCOTLAND

In order to create a data set which had data from all census years redefined to the regions as used in the 1991 census of Scotland, the changes below had to be made. County changes occurring within the same region were ignored, since they did not affect the overall data once the county totals had been aggregated to the regional level.

1931 - 1951

Basically no changes, except that in 1931 the Clydeside Conurbation did not exist. Since this was created out of, and contained within the 1991 Strathclyde region, this was simply ignored throughout the calculations.

1951 - 1961

By 1951 the data included the Clydeside Conurbation. Some New Towns appeared before 1961 but since each town was contained within a single 1991 region, these were simply ignored throughout the calculations.

1961 - 1971

The 1961 Data included some of the New Towns (Cumbernauld, East Kilbride, Glenrothes).

By 1971 the New Towns of Irvine and Livingston were created. Since Livingston affected 2 of the 1991 regions (Borders & Lothian) this was calculated as below, and the Midlothian and West Lothian figures adjusted accordingly.

Livingston = Midlothian \times 0.0047 + West Lothian \times 0.0171 (approx.)

Then Midlothian @ 1971 = (1-0.0047) Midlothian
and West Lothian @ 1971 = (1-0.0171) West Lothian

1971 - 1981

The major boundary changes took place in Scotland between these dates. A summary of the changes is given in the table below.

1981 Region	1971 Counties & New Towns included
Borders	Berwick, Roxburgh, Peebles, Selkirk, 0.008 \times Midlothian
Central	Clackmannan, 0.121 \times Perth, 0.903 \times Stirling, 0.123 \times West Lothian
Dumfries & Galloway	Wigtown, Kircudbright, Dumfries
Fife	Fife, Glenrothes New Town
Grampian	Banff, Aberdeen County, Aberdeen City, Kincardine, 0.952 \times Moray
Highland	Caithness, Sutherland, Nairn, 0.051 \times Argyll, 0.048 \times Moray, 0.651 \times Ross & Cromarty, 0.893 \times Inverness
Lothian	East Lothian, Edinburgh City, Livingston New Town, 0.877 \times West Lothian, 0.992 \times Midlothian
Strathclyde	Central Clydeside Conurbation, Cumbernauld New Town, East Kilbride New Town, Irvine New Town, Bute, Dunbarton, Glasgow City, 0.097 \times Stirling, 0.947 \times Argyll
Tayside	Angus, Dundee City, Kinross, 0.872 \times Perth

Orkney	Orkney
Shetland	Zetland
Western Isles	$0.107 \times$ Inverness, $0.349 \times$ Ross & Cromarty

1981 - 1991

In this period, only a few small changes occurred. These can be described in the table below :

1991	1981	Borders	Central	Dumfries & Galloway	Fife	Grampian	Highland	Lothian	Strathclyde	Tayside
Borders		1.000						0.00012		
Central			0.99962						0.00009	
Dumfries & Galloway				1.000					0.00001	
Fife					1.000					0.00005
Grampian						0.99999				0.00003
Highland						0.00001	1.000			
Lothian								0.99988	0.00007	
Strathclyde									0.99983	
Tayside			0.00038							0.99993

For example, $1991 \text{ Borders} = 1981 \text{ Borders} + 0.00012 \times 1981 \text{ Lothian}$
 $1991 \text{ Central} = 0.99962 \times 1981 \text{ Central} + 0.00009 \times 1981 \text{ Strathclyde}$

4. CALCULATING THE NUMBERS OF UNEMPLOYED, ACTIVE AND POPULATION BY AREA FOR THE INTERCENSAL YEARS

At this stage the data set included figures for all counties at each of the census years (1931, 1951, 1961, 1971, 1981, 1991), broken down by the counties/regions as defined in the 1991 census.

What was now required was some way of interpolating this data (at county/regional level, and for males & females separately) in order to create data sets for each year from 1946-1990. An entropy maximizing approach was used, this is set out in Appendix B.

The 'rates' of unemployment and activity were of interest, in order to make county/regional comparisons.

These were calculated as follows for each county/region ;

$$\text{Unemployment Rate} = (\text{Number Unemployed}) / (\text{Number Active})$$

$$\text{Activity Rate} = (\text{Number Active}) / (\text{Population})$$

These were calculated for males and females separately, within the county/region, as well as for each county/region as a whole.

APPENDIX A: COUNTIES/REGIONS AS DEFINED AT THE 1991 CENSUS

AVON
BEDFORDSHIRE
BERKSHIRE
BORDERS
BUCKINGHAMSHIRE
CAMBRIDGESHIRE
CENTRAL
CHESHIRE
CLEVELAND
CLWYD
CORNWALL & ISLES OF
CUMBRIA
DERBYSHIRE
DEVON
DORSET
DUMFRIES & GALLOWAY
DURHAM
DYFED
EAST SUSSEX
ESSEX
FIFE
GLOUCESTERSHIRE
GRAMPIAN
GREATER MANCHESTER
GWENT
GWYNEDD
HAMPSHIRE
HEREFORD & WORCESTER
HERTFORDSHIRE
HIGHLAND
HUMBERSIDE
ISLE OF WIGHT
KENT
LANCASHIRE
LEICESTERSHIRE
LINCOLNSHIRE
LOTHIAN
MERSEYSIDE
MID GLAMORGAN
NORFOLK
NORTH YORKSHIRE
NORTHAMPTONSHIRE
NORTHUMBERLAND
NOTTINGHAMSHIRE
ORKNEY
OUTER LONDON
OXFORDSHIRE
POWYS
SALOP
SHETLAND
SOMERSET
SOUTH GLAMORGAN
SOUTH YORKSHIRE
STAFFORDSHIRE
STRATHCLYDE
SUFFOLK
SURREY
TAYSIDE
TYNE & WEAR

WARWICKSHIRE
WEST GLAMORGAN
WEST MIDLANDS
WEST SUSSEX
WEST YORKSHIRE
WESTERN ISLES
WILTSHIRE

5. THE DERIVED SET AND REMAINING PROBLEMS

For ease of use the data set has been provided as an SPSS portable file containing figures for each county, and for each year from 1946-1991.

The variables provided are as follows :

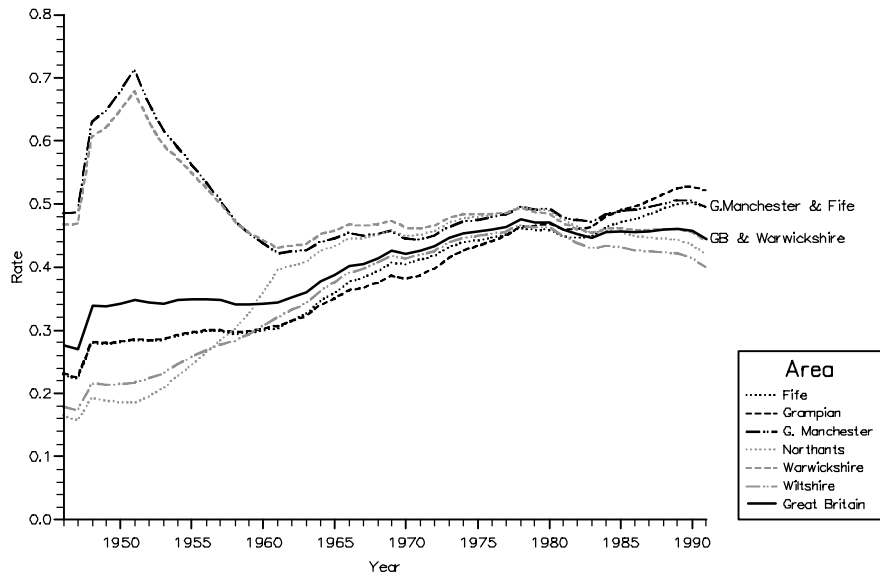
Male Unemployment figures †
Female Unemployment figures †
Total Unemployment figures †
No. of Active Males °
No. of Active Females °
Total No. Active °
Male Population *
Female Population *
Total Population *
Male Unemployment Rate
Female Unemployment Rate
Total Unemployment Rate
Male Activity Rate
Female Activity Rate
Total Activity Rate

- * Population figures are the ‘working’ population - i.e. the population over 14,15 or 16 years of age, depending on year of census.
- † Unemployment figures given include (at least up until 1981) the temporarily sick. Figures are again given for those of ‘working’ age (over 14,15, or 16 depending on year of census).
- ° Active figures include both employed and unemployed who are ‘available for work’ and are again of ‘working’ age (over 14,15, or 16 depending on year of census). The active population is basically defined as the ‘working’ population minus those who are ;
 - retired from gainful occupation (all years)
 - students in an educational institution (all years)
 - those permanently sick (1961 to 1991)
 - those following an occupation outside the UK (1931 & 1951)
 - institution inmates (1971)
 - those otherwise not economically active, or for whom no gainful occupation was stated (all years)

The differences in definitions of ‘inactive’ population throughout the years are assumed to be covered by the category ‘otherwise not economically active’.

To assess the adequacy of the derived data we selected the 6 areas which contain the cities/towns used in the SCCLI study and produced some plots, see figure 1 and 2 on following pages. Each plot contains a rate at the county or regional level for 6 areas, together with the GB plot.

Female Activity Rates 1946-1991



Male Activity Rates 1946-1991

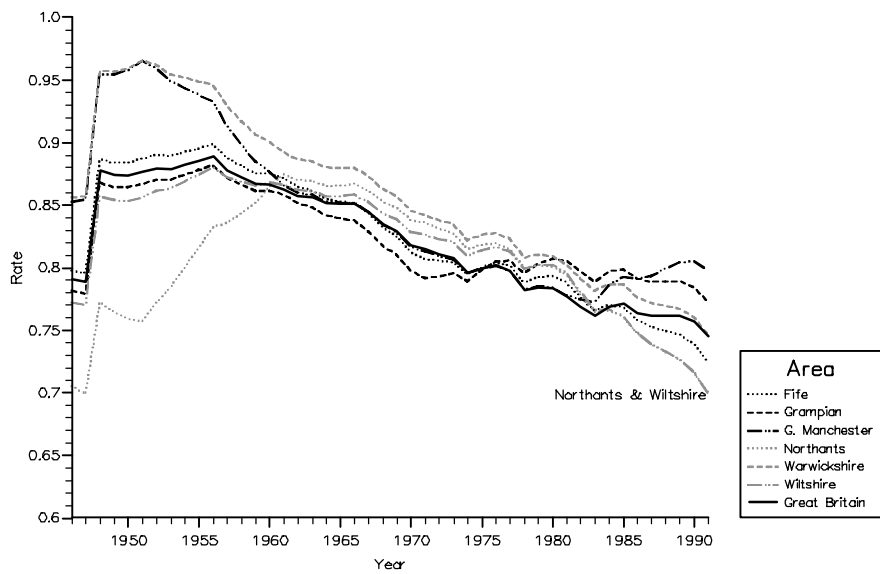
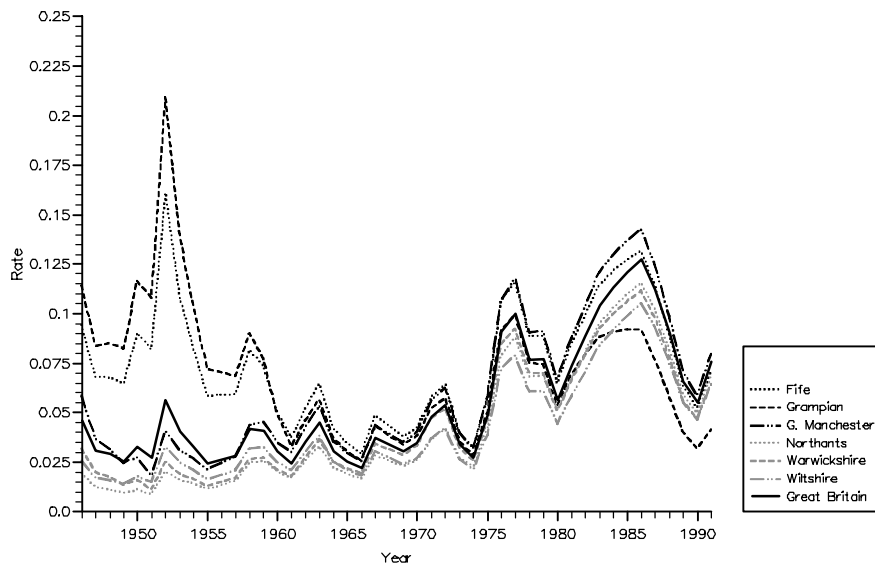


Figure 1 Activity Rates

There seems to be a problem with these plots over the period 1946-1961. There is a peak in 1952 in the G. Manchester and Warwickshire plots. For males the peak is at 96%, for females it is at 70%. These peaks seem far too high. The plots are very jagged for 1947-1948, suggesting a discontinuity in the aggregate data. These issues require further investigation.

Female Unemployment Rates 1946-1991



Male Unemployment Rates 1946-1991

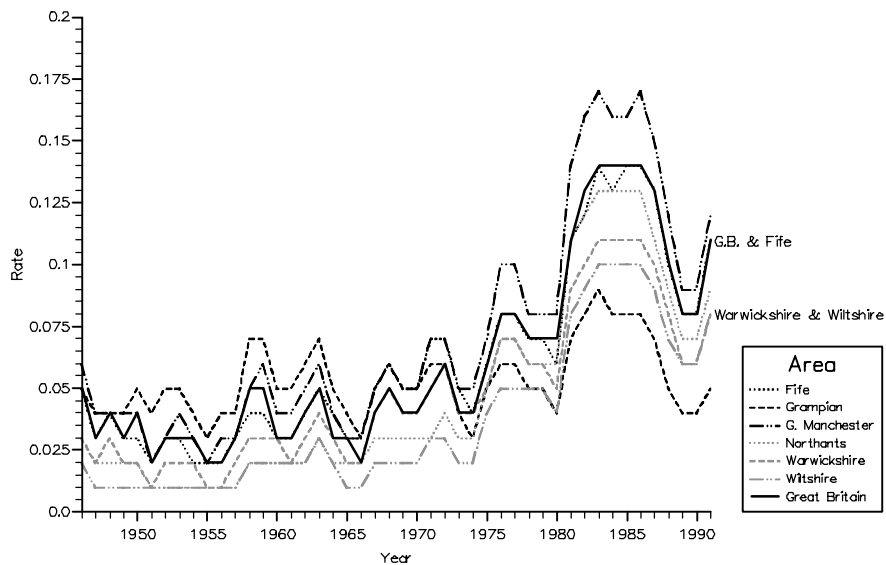


Figure 2 Unemployment Rates

These also seems to be a problem with the female unemployment rate in 1952, which seem too high, this also requires further investigation.

The male unemployment rate seems more reasonable, it shows, as expected, the cyclical movements in the GB unemployment rates being reflected within each area with conspicuous peaks in unemployment during the recession of the 1980s. It is also interesting to look at their relative changes, where the plots seem to be consistent with our intuition, for instance, we can see that the old industrial area of G. Manchester has fared worse than the others from 1970 onwards and did particularly badly in the 1980's. In 1946 Fife, Grampian and G. Manchester are above the national rate, only G. Manchester remains consistently above the GB rate for most of the plot. The male plot (over the period 1960-1988) is similar to those found in Marsh and Vogler (1991, figure 2.5) and Penn (1992, figure 1) for the SCOLI travel to work areas.

APPENDIX B ENTROPY FORMULATION FOR THE AGGREGATE
LABOUR MARKET DATA BY AREA FOR THE INTERCENSAL
YEARS

Changes in definitions of area boundaries, industrial/occupational classifications, and in the definitions of relevant populations all conspire against the user of official statistics. However, we concluded that it was worth an attempt to derive male and female levels of unemployment U_{jt} , population of school leaving age P_{jt} and activity A_{jt} by area j and intercensal year t . From these aggregate statistics we can derive $E_{jt} = A_{jt} - U_{jt}$, the number in employment and the number out of the labour market $O_{jt} = P_{jt} - \sum_i A_{jt}$. These numbers can then be used in computing the relevant rates for each area.

More detailed time series data are available from the Dept. of Employment (Ministry of Labour Gazette, Abstract of Labour Statistics) but these refer to somewhat differently defined unemployed and workforce numbers, and are aggregated over geographical areas. A formal combining of these data was not therefore possible and an Entropy Maximising approach was adopted, similar to that used in Crouchley et al (1991). This provided a time series between the Census data values that was maximally consistent with the aggregate time series.

We will illustrate the approach for males, a similar argument was applied to the female data, let

A_{jt}^m , represent the number of males m in sector i and county j in year t that are economically active,

U_{jt}^m represent the number of males m in county j in year t that are unemployed,

P_{jt}^m represent the population of males m in county j in year t

The entropy maximizing problem is defined for each time t as max

$$Z_t^m = - \sum_j A_{jt}^m \ln[(A_{jt}^m/A_{jt}^{m*}) - 1] - \sum_j U_{jt}^m \ln[(U_{jt}^m/U_{jt}^{m*}) - 1] - \sum_j P_{jt}^m \ln[(P_{jt}^m/P_{jt}^{m*}) - 1],$$

over $A_{jt}^m, U_{jt}^m, P_{jt}^m$ subject to the aggregate constraints

$$\begin{aligned} \sum_j A_{jt}^m &= A_t^m, \\ \sum_j U_{jt}^m &= U_t^m, \\ \sum_j P_{jt}^m &= P_t^m, \end{aligned}$$

where

$$A_t^m = \left[d_t \frac{A_s^{mc}}{A_s^{ma}} + (1 - d_t) \frac{A_v^{mc}}{A_v^{ma}} \right] A_t^{mc},$$

$$U_t^m = \left[d_t \frac{U_s^{mc}}{U_s^{ma}} + (1 - d_t) \frac{U_v^{mc}}{U_v^{ma}} \right] U_t^{mc},$$

$$P_t^m = \left[d_t \frac{P_s^{mc}}{P_s^{ma}} + (1 - d_t) \frac{P_v^{mc}}{P_v^{ma}} \right] P_t^{mc}$$

$$d_t = \frac{v - t}{v - s}$$

The aggregate statistics for between census years, A_t^m , U_t^m , and P_t^m are derived from a weighted function of the overall Census data (superscript c) at times s and v that straddle the aggregate data (superscript a) for the year of interest t . This function has the advantage that for each Census year $A_t^m = A_t^{mc}$. The prior weights are given by

$$A_{jt}^{m*} = d_t A_{js}^{mc} + (1 - d_t) A_{jv}^{mc},$$

$$U_{jt}^{m*} = d_t U_{js}^{mc} + (1 - d_t) U_{jv}^{mc},$$

$$P_{jt}^{m*} = d_t P_{js}^{mc} + (1 - d_t) P_{jv}^{mc}$$

The first order optimality condition of this constrained optimization problem give

$$A_{jt} = \frac{A_{jt}^{m*} A_t^m}{\sum_j A_{jt}^{m*}},$$

$$U_{jt} = \frac{U_{jt}^{m*} U_t^m}{\sum_j U_{jt}^{m*}},$$

$$P_{jt} = \frac{P_{jt}^{m*} P_t^m}{\sum_j P_{jt}^{m*}}$$